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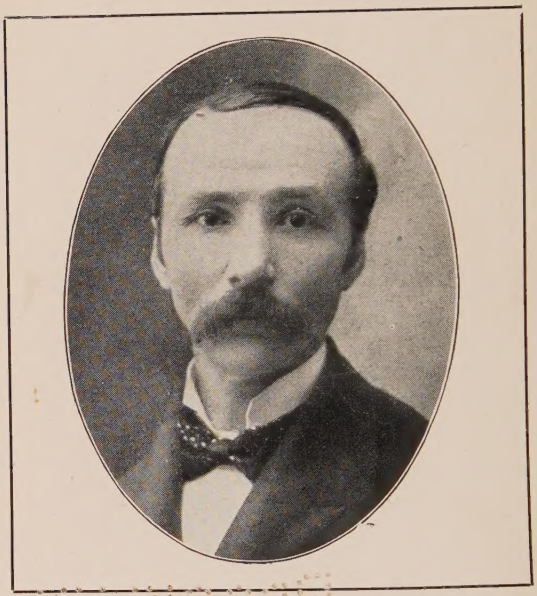

Yours Sincerely,

Robert G. Eccles.

LETTERS FROM FOREIGN LANDS

ROBERT G. ECCLES, M. D.
BROOKLYN, N. Y.

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SEEING TURKEY WITH MEDICAL EYES.

R. G. ECCLES, M. D.

BROOKLYN, N. Y.

BEFORE leaving the United States for a periterrestrial tour the writer promised the editor of the MEDICAL FORTNIGHTLY that he would send him some letters descriptive of the people and countries visited. Since that promise was made days have extended into weeks and weeks into months without an opportunity having occurred in which to redeem that pledge. Those who confine their journeyings to the main water routes have ample leisure time in which to write, but those who, like myself, journey most of the way overland and at short daily stages, find it impossible to settle down to careful or concentrated thought. Having, since leaving home, covered nearly fifteen thousand miles, exclusive of my main sea voyages, and having by horse, donkey, jaunting car, carriage, row boat, sailing boat and launch visited over one hundred regions of interest to tourists, as well as others of purely personal interest, opportunities to even write short letters have been very scarce. This communication is being written in the Indian Ocean, between Cape Guardafu and Ceylon, on the steamship Prussin. It is the first opportunity for such work that has presented itself.

Milton refers to India as the "Gorgeous East." It can be applied with equal aptness to Turkey. There is probably no city in the world more likely to give a passing traveller the impression of gorgeousness as does Constantinople. The contour and hill curves of Stambul, Pera, Galata, and Scutari are decidedly beautiful. The indentations of the Sea of Marmora, the Bosphorus and the Golden Horn impress the susceptible like a charming poem. When seen from the deck

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of an incoming ship the curved domes, the graceful minarets, and the many towers that meet the vision add a charm of novelty and strangeness to the scene that is wanting in all other cities. Those who are fortunate enough to see all these amid the splendor of a brilliant sunset, as the writer was, are sure to feel as if the heavenly doors had been left ajar and they were stealing a furtive glimpse of paradise. Then the splendor reaches its maximum, and it is simply indescribably beautiful. As myself and companion made our first entrance, from the Sea of Marmora, the sun hung like a ball of fire, suspended among crimson clouds, at the rear of our ship. As we looked at Constantinople every window in Stambul and Scutari, as well as far up the hills of Pera and Galata glittered and corruscated as if illuminated by flames of crimson and gold. At every step of our progress, around Seraglia Point, there was an incessant shifting of the magnificent panorama and a constant changing of the grand pyrotechnic display. Our ship swept to the mouth of the Bosphorus in order to drift with the tide into her place of mooring in the Golden Horn. Then a magical transformation occurred. We now viewed Stambul from the opposite side and the sun, instead of being at our backs, formed a magnificent crown which seemed to rest exactly over the dome of San Sofia. Every one of the many minarets, that there greeted the eye, seemed to flaunt a banner of crimson and burnished orange, due to the myriads of little fleecy clouds that hovered over them. The sky shaded from the flaming splendor of the sun through all the warm colors of the spectrum to yellow, pale green and finally azure. It is common for visitors to Constantinople to go into ecstacies over the splendor of its first appearance, but to see it at its best it must be seen painted in the lavish manner that nature adorned it on that occasion. A picture with such colors would probably bring the artist into disrepute for exaggeration, and it is my fear that this word painting may have a similar effect on the readers of the FORTNIGHTLY.

Without stopping to emphasize the fact of its sober reality permit me to proceed to the statement that the enchanting splendor here depicted soon met with disillusion. Constantinople as seen from a ship and Constantinople as seen at close range, within its streets, constitute two quite unlike experiences. Mud and filth, squalor and degradation jostle each other in the streets. They even meet face to face in homes and mosques. The supposedly sacred places are, from the American view-point, indescribably dirty. The finest mosques, from San Sofia downward are kept in a condition of neglect that is most distressing to every visitor who has expected better things. In no Christian land would the poorest of churches be left with such utter lack of care. The Mohammedans pride themselves on their cleanliness. They must wash at least five times a day. The Koran commands it. Public opinion demands it. But, alas, some of the washing that is done, even within the secret precincts of mosques and tombs is terribly perfunctory. All around the outer walls of the mosques are placed numerous washing places, each with a supply of water. The faithful must perform their ablutions in these places before entering to pray. To see some enter with the water unremoved and dust-clouds polluting them, while others thoughtlessly wipe cff their faces with filthy garments that moment before had been in the mud, racks the Christian onlooker with mirth and sadness, as they contend within him for the mastery. One does not know whether to laugh or cry at such a sight. When away from a supply of water they are permitted to use sand as a substitute before praying. Sand could certainly make them no dirtier than Constantinople or Damascus mud. Whenever a Giaour enters a mosque he must cover his shoes with slippers—and such slippers. We had always to call in the services of a shoe black after this operation. As we wandered over the mat-covered floors our movements sometimes pumped out of them enough dust to show itself on our garments.

With numerous tourists doing the same every day, what must be the condition of those floors and rugs? That dust was the dried mud of filthy streets. Had we entered the mosque as we enter a church our shoes would have been wiped with scrupulous care. In the orient no such wiping occurs and the dirt merely accumulates within the slippers to, later, be transferred, germs and all, into the interior of the supposedly sacred edifice. But this is not the most unhygienic feature of these places. The dampness, due to so many water faucets, the stagnant mosquito-breeding pools that underlie them, and the Mecca pilgrims, make every mosque in Turkey a focus of disease. Each mosque is, practically, a hotel for tramps. It supplies sleeping places for the pilgrims who pass it on their way to the Holy City of Arabia. They eat, sleep and do their washing within its sacred grounds. Sometimes there are more of them in a single mosque than guests in the best hotels. Whether germ-laden or pediculi covered, it is all the same. They horde together and breed infective material to scatter to others. At this season of the year there are always one or more ships in the harbors of all Turkish ports carrying the green flag, that indicates that they are going to Mecca with pilgrims. From every surrounding region they go in multitudes to these ports and take passage in these ships. We hear much about the infection which they bring back from Mecca, but little about the infection which they carry to that center from the mosque en route. Mosque and mosquito spell much the same thing and the system of ablutions, inaugurated by Mohammed, is not only responsible for this, but is also responsible for the dampness of skin and garments that make possible the planting on the cuticle of the microbes of leprosy. If the prophet could come back to earth and, with intelligent, educated eyes, see the results of his well-intended efforts in trying to make the impure pure, and the immoral moral, he would be shocked at the way it has all miscarried. Enforced reform usually, and probably always, miscarries,

producing results the reverse of those intended. The unspeakableness of Turkey is less in Turkish intent than in the foulness that develops from the Turk's most ideal acts. The bigotry of the fanatical and the filth of the streets he would be willing to concede are in need of correction, but that the very essentials of Saracenic teaching could lead to an evil that curses the whole earth, the most advanced of them would not for a moment believe. Yet to this the world is indebted for the spread of plague, of typhoid fever, of Malta fever, of Asiatic cholera, of leprosy, and of malaria. With the hope of keeping down mosquitos eucalyptus trees are being planted all through the country, but no effort is, or will be, tried to close up the most prolific breeding places of these pests.

"Faith, fanatic faith, once wedded fast
To some dear falsehood, hugs it to the last."

But force of habit in secular affairs leads to conditions about as bad as in religious. Little effort is made to keep the streets clean. If it was only clean mud that had to be complained of it would be bad enough. When that mud is impregnated with unmentionable foulness from human beings and multitudes of pariah dogs, and when at every turn in a street one has to keep a sharp lookout in order not to step into putrescent filth there is certainly wide latitude for complaint. For ages our people believed blindly in the scavenger qualities of house-flies, ignorantly thinking that they performed a useful function in ridding the earth of decomposing organic matter. In Turkey this delusion seems to be applied to dogs. While they have an abundance of flies that carry infection from cesspools to bakeries and butcher shops and plant the same on food, to bring forth harvests of a hundred-fold, they do not appear to think these public benefactors. The dogs, however, are looked upon as something of a blessing. Their numbers astonish every newcomer, and the astonishment grows on learning that not one of these numerous barking and howling packs, that act as murders of sleep, are owned by any person. They are

supposed to earn the waste food that is thrown at them by acting as scavengers. The newcomer who takes pity upon them is himself at once converted into a being worthy of pity. One day, in lieu of any better gift, I patted the head of one of them and spoke a kind word to it. Instantly it acted as if a long lost friend had been discovered, and nothing less would satisfy it than to try and reach my face with its caresses. In an instant not one but ten dogs were around me all trying to become first in my affections, while from every direction new recruits were hurrying to join in the general love-feast. But for the boot-toe of my Musselman guide it would be difficult to say how numerous the pack would have reached, or how much like a mud-bedraggled scare-crow I would have become. They were all imitating their oriental betters in trying to cajole me into giving "backsheesh." With wagging of tails, twisting of bodies, and grimacing of faces they were all trying hard to say: "Allah bless thee as a free giver, thou kind one sent to me from heaven." That these dogs act as faithful scavengers is no doubt true. That by so doing they can save a city from plague is highly problematic. The false notion that the germs of putrefaction are the germs of disease plays strange tricks on human logic. The fetid odor of decomposition is not the odor of infective germs. Neither sulphuretted hydrogen or skatol are products of typhoid, cholera, or plague germs. When the dogs of Turkey remove putrefying material from the streets they in no way save the people from disease. Should that putrefying material accidentally get infected with pathogenic micro-organisms and any person try to handle it or eat it, then trouble would begin to brew. Should a pariah dog eat it he would at once become a lively center of infection to scatter the seed from its original focus. By eating up the infected mass he would certainly deodorize it, but he might not disinfect it. Turkey's dogs act as deodorizers of foul-smelling materials, but while doing so they are quite likely to act as

centers for disseminating disease. They constantly veneer the streets with their dejecta that, as likely as not, is frequently infected by pathogenic micro-organisms. In the broad streets of occidental cities direct sunlight is constantly at work killing such germs. In the streets of Turkish cities the sun gets but small opportunity to help in this way and in the bazaars and homes of the people it gets less. A gleam of sunlight is a rarity in many of them. So narrow and so crooked are they that it is with the utmost difficulty that a stranger can tell which direction he is travelling, whether he is out in the street or within a merchant's mart. None of the streets are broad. Some are startlingly narrow. Those in which the opposite walls can be touched simultaneously with the fingers of the right and left hands are not infrequent. When bay-windows extend from each side above, they very often touch. The widest streets barely permit of the passage of two vehicles, and between these and the arcaded marts, known as bazaars, are all degrees. Of the latter class of streets(?) there are in Constantinople, Brusau, Smyrna, Damascus, and Jerusalem many miles. They form immense sheds, through the windowed roofs of which an occasional glimmer of direct sunlight may pass. Within these arcades numerous merchants display their wares, each having an arched recess in the wall that he uses as a store or shop, and on the shelves of which are kept such goods as are not found on his share of the street, or on the floor of his reservation. Often they have more of a display laid out on the public street than within his store. Within the immense inclosures, the various classes of merchants and tradesmen are found in assorted groups. The butchers are together, the bakers are together, the grocers are together, the saddlers are together, the shoemakers are together, the dealers in silks are together, and so on through the list. The only class that is not grouped in this manner are the money-changers, a class of merchants only known to Americans as the fellows that Christ drove

from the temple at the time of his triumphal entry into Jerusalem. Here they are probably the most numerous of any one class of dealers, and they have scattered themselves all over every Turkish city. Their work is, as their name implies, the changers of money. In America merchants make change for all purchasers and sometimes for non-purchasers without a murmur. In every Turkish city the purchaser must supply his own change, or the merchants are likely to take more from him for changing his bill to pay themselves than he would have to pay the regular money changer. Every time a bill is changed the one who does the changing demands a profit. This is how it happens that so many of these changers are found in every place where there are stores.

But, to return to a consideration of the immense arcaded bazaars. What can be the condition of the air within them? At the close of business the dark recesses containing the goods are closed with an iron draw-down shutter, thus forming a doorless, windowless vault. The arcaded lanes are lined, from end to end, with these. Thousands of such dingy prisons constitute the day homes of their proprietors. While we do not know whether any estimate has been made of the amount of carbon di-oxide found in the air of these grottoes we do know that it must exceed that of any standard fixed by a board of health for a church or school. The numerous merchants together with the still more numerous patrons cannot do otherwise than render the air unfit for respiration. The absence of direct sunlight precludes natural disinfecting of the germs of infected breath, of tuberculous sputa and of other contact and air borne diseases. Nor do Mohammedan merchants gain much by going home. Their houses have every window that faces a neighbor's home or a street covered with close wooden lattice work. This is to keep masculine eyes from gazing on the ladies of the harems while they are unveiled. In the streets these women must not show their faces. Only the eyes can be seen

through an opening over the thick veil. When they travel in a street car the conductor must draw over the seat they occupy a heavy curtain that extends from roof to floor of the car. At best the air in these cars is none too pure, and in warm weather the heat is stifling, but air delicate Mohammedan women must endure such torture, in order to conform to the demands of public opinion. When on board Christian ships those of the higher class abandon their Turkish costumes and appear like the rest of the passengers. One would think that when a Mohammedan lady, upon a street car, is curtained around, that her husband would seat himself by her side and keep her company. This, however, does not occur. He betakes himself to the coolest and airiest part of the car, on all warm days, and when they leave the car she must walk behind instead of alongside her lord and master. But women, in Turkey, receive no chivalrous treatment. Even when she ventures into a mosque to pray, a scowl instead of a smile is pretty certain to greet her, and hence it happens that men, not women, throng these places of worship. The only places where great numbers of women can be seen praying is in the grave-yards. There, one day in the week, they go and place flowers over the graves of loved ones and bend the head in secret prayer, or go through the long formality of worshiping Allah in the direction of Mecca while telling over the 99 beads of his sacred names. These women, too, in imitation of their Irish, Spanish, Italian and French sisters, frequently place votive offerings at the tombs of the dead in order to get healed of some affliction or to get good luck. The men are inclined to scoff at them for this weakness.

It would be interesting to know how large a proportion the bald-headed bear to the normal haired throughout Turkey. The fez and turban are such close-fitting head-gear that one would naturally expect to find them to be frequent causes of baldness. So few were the aged people that I saw while travelling there that it was a frequent source of wonder what

had become of them. Possibly, like the women, they were kept at home. But the red fez is one of the things that first attracts the tourist's attention, and then the numerous places where what appear to be great numbers of brass cooking pans are displayed, is next. The supposed brass pans are presses for restoring the forms of fezzes after they get out of shape by wear. To stand on the bridge at the entrance to the Golden Horn and watch the passing crowds of men of every nationality crossing and recrossing is an interesting sight. The great majority wear the bright red fez. There are Albanians with pants, the seat of which flops and swings behind them as it almost touches the ground. On their heads are perched red fezzes. There are Arabs with black gowns extending to their feet, making them look like women but for the red fez. There are Greeks in a costume almost exactly like that of the ballet-girl of the theatre, and on their heads are red fezzes. There are dervishes with garments of sackcloth or camel's hair with as little the shape of human clothing as a gunny-sack, and they too have the fez. There are men wearing garments that look as if they might have been made by a New York tailor, and they, too, are topped with the red fez. But they do not all wear this style of head-gear. Multitudes pass, around whose heads are wrapped yards of cotton cloth to form a turban. Usually each turban contains about five yards of cloth that is nearly a yard wide Some of them are made of a colored shawl or handkerchief fastened in place by a dexterous twist, or held in position by a black snake-like double coil. The descendants of the prophet are distinguishable by a green band around a fez or turban. To describe all the grotesque forms of garbs that cross that bridge in a day would baffle the most expert writer in the world, but the one fact that can be pointed out is the complete defiance of all rules of health for the hair, which the majority pursue. Not satisfied with wearing these head-coverings in life the faithful decorate their tombs with them after death. The

tombs of kings have the real head-gear of the respective monarchs placed at the heads of their biers. The plain citizens get the stone-cutters or wood-turners to represent their fez or turban on their tomb-stones and tomb-boards.

But, perhaps, the most startling among the many startling sights that a stranger sees on that bridge is the loads carried by the native porters. Everything from building stones to pianos, and from dead horses to sides of beef are carried on men's backs. There are no truck horses or truck carts. A street porter will pick up, carry for blocks on his back, and deposit on the fifth floor of a hotel the heaviest Saratoga trunks ever brought to the place by the travelling tourists. It is no unusual thing to see them come along with an immense iron range or a Steinway grand piano, perched on their backs. I have seen one man carrying, balanced on a pole thrown over his shoulder, three carcasses of large sheep. It is common to see them with a whole side of beef or a small block of granite. Three or four of them with poles, on which to suspend the load, will carry, through the streets, polished corner-stones or other building stones weighing a ton. I should expect to discover, by tracing the life histories of these men, that they finally submit to spinal curvature, emphysema, aneurism, or heart disease. Where they go with their loads everybody has to get out of their way and when going without a load the mere force of habit seems to make them think that everybody should even then keep out of their way.

Many tourists in the Turkish dominions suffer from diarrheal troubles. So-called Malta fever is common. That these troubles do not come from the water is pretty certain since those who suffer most are found among those who never drink the native water. They invariably use bottled water and other bottled beverages at the table. The writer drank with impunity the local supplies of water in every place and did not have any sickness but an influenzal coryza, or severe cold, due,

probably, to contact with other sufferers, during or following a chilling. Goat's milk is about the only kind of milk supplied to travellers, and this has long been suspected as the carrier of Malta fever. Goat's butter may not be free from the germs of this fever, but it is not likely that it carries enough to impart any disease. Its appearance, when first seen by the tourist, makes it quite a curiosity. In places where no artificial color is added it is almost as white as snow, at this season of the year. My first introduction to it was at Brusa, and in going to that place I had my first introduction to the Turkish teskerah. This is a kind of passport that all foreigners must get before being permitted to leave any city on the Turkish coast. It has the double advantage of enabling the government to keep track of every move we make and compelling us to turn some of our American dollars into the Sultan's exchequer. At every change to a new place it must be viséed and inspected, otherwise the traveller is not permitted to leave. It would be useless to show our American passport. That, even when properly viséed by a Turkish consul, is no good in Turkey except as it is needed in order to get a teskerah. Every time this instrument is viséed a new fee is demanded, so that in making an extended tour one's Turkish taxes become about as great as his home taxes when he owns a fair share of real estate.

In my next communication I will refer to the medical situation in Turkey, but in the meantime will call attention to the fact that every person in the Sultan's dominions looks upon himself as a specialist, since he fixes his charges in proportion to what he thinks his patron is able or willing to pay. There are no prices for anything in the country. The prices asked, even by the boot-blacks, the barbers and the bakers are such as the case is likely to bear and without sharp bargaining strangers get woefully fleeced.

THINGS MEDICAL IN TURKEY.

My former communication to the Medical Fortnightly promised a supplemental one regarding Turkey. Illness and other things have caused a longer delay in keeping that promise than was then expected. Medical men in hearing from such a country are, naturally, anxious to learn of how the medical profession stands there; how numerous the doctors are in relation to population; what kind of work they do; how the people receive them; what their remuneration, and what their facilities for keeping abreast of progressing science. It would be difficult to give any approach to a complete reply to such enquiries, as such statistics as would be necessary to lay bare all the facts are not at all procurable by a mere tourist, and if procurable by others it is with difficulty that they can obtain them. It is quite certain that the number of qualified medical men in relation to population is exceedingly small. For the 6,000,000 of inhabitants in European Turkey there is certainly nothing like 6,000 such men, and for the 17,000,000 in Asiatic Turkey the proportion is even more meagre. The number of hospitals in all of Turkey, that are worthy the name of hospital, could almost be counted by the digits on the hands of one man. There is certainly room enough in Turkey for the excess of good doctors that now crowd the cities of the United States. But when it has been said there is room enough and work enough there, that is as far as can be truthfully stated. The remuneration and appreciation are lacking. The humanitarian demand is great, but the commercial demand small. There is an excellent medical college connected with the university at Constantinople, and its graduates are said to be as efficient as those of the best European colleges. A strict examination must be passed by every student, as well as by

every one who seeks to practice medicine in Turkey. This examination occurs before the faculty of medicine of the university, a body which contains Turkish, Greek, French, German and American medical men. Every case of malpractice is tried before this same body, as the civil courts have no jurisdiction in such cases. The diploma which they issue is accepted in every state throughout the empire as sufficient evidence of the qualifications of its possessor. There is no need for reciprocal legislation there. Boys who desire to possess a medical diploma require nine years of constant training in order to obtain it. This training costs them nothing while receiving it, but must be paid for in services to the government, or in cash, after graduation. Service in the army or navy as surgeons, for a definite time, cancels their obligation. Most graduates prefer this to paying for their tuition, as it has the double advantage of wiping out their indebtedness, and giving them an excellent training in the work they will be called upon to perform in civil life. It is a rather singular fact, however, that in spite of such training there is a woeful lack of interest, among Turkish doctors, in surgical work. They leave most work of this kind to be done by foreign doctors so that the latter are usually overburdened with their duties in this line. One American surgeon, Dr. T. S. Carrington, of Constantinople, informed me that while he was acting as surgeon at the Anatolie College Hospital, in Merzifun, he had 300 major operations to perform within seven months.

In connection with the university, in Constantinople, is a well equipped Pasteur Institute. The multitudes of pariah dogs that throng the streets of every town and city in the Turkish dominions might lead one to infer that this institution would be overwhelmed with work, particularly as it is the only one within a territory embracing many thousands of square miles. It was a surprise to learn that this is not the case. It became still more surpising to be informed that every victim of a rabid dog, anwyhere within

Turkey, has the privilege of going to Constantinople, at the government's expense, being treated without cost, and being supplied with necessary food during the journey, and while under treatment in the same superliberal terms. Can it be possible that generations of selection has rendered Turkish dogs almost immune to hydrophobia, so that but few of them, in proportion to the total num-

Lucepere, first native trained nurse in Turkey.

ber, are ever afflicted with this disease? The relatively small number of cases would seem to indicate that some such condition must exist. The work being done is certainly highly commendable and reflects great credit upon the Turkish authorities. In some respects as the reader must have seen, medical conditions in Turkey are better than they are in America. Some of my readers might not be ready to commend the paternal care of the government when it supplies the

patient treatment, transportation, board and lodging free of charge, but no one can deny that the universal acceptance of a properly attested and worthily gained medical diploma is something of an improvement upon conditions at home. The thorough training and liberal terms on which a Turkish medical education is obtained is of great advantage to ambitious young men, and the method of supplying the same might be copied advantagecusly by our own government.

On first learning the facts here enumerated I began to think that Turkey must be a sadly maligned country, but soon it began to dawn upon me that here might be another case of external illusive splendor with internal, persistent squalor. It was impossible to forget our beautiful vision of Stamboul, Pera and Galatea that was so quickly disillusioned by dirty streets and abject misery. I could not help but think that if Turkey was doing so much, in a medical way, for its people, surely there could be no need for missionary colleges, missionary doctors, and missionary hospitals. If what is being done is but a thin veneering to give an appearance of splendor, where the reality does not exist, then these missionary efforts are justifiable. Questioning a number of the missionaries themselves, it began to appear that this was dangerous ground. Their reticence was eloquence. They told all that was favorable to Turkey, but would answer no pointed questins that might lead them into trouble with the government. Their knowledge in such matters was evidently censored. My Murray's guide book had warned me to slip it into a convenient pocket, away from my luggage, when landing at Constantinople, unless I did not mind having it confiscated. I had been told to keep out of sight all books upon Turkey that referred to its religion or its politics except in glowing terms of praise. Even so innocent a journal as the Literary Digest that had been sent to me from New York had to be forwarded in care of the British Postoffice, in order to keep its pages from being sullied by black patches where infor-

mation bearing upon Turkey happened to have been printed. The fact that most of the leading nations, doing business in Turkey have postoffices of their own in the chief ports, means more than words need tell. Few foreigners ever use the Turkish postoffices, either in sending or receiving mail from abroad and they avoid it, when they can, in correspondence within Turkey. That literature was under perpetual surveillance, by the censors, was notorious. That the lips of teachers, preachers, and physicians were sealed, as a means of avoiding persecution or unnecessary annoyance from Turkish author-

Anatolia Hospital—View in men's ward.

ities, was a new revelation. Why has Turkey a well equipped hospital and excellent Pasteur Institute in Constantinople with nothing of the kind in the interior or remote cities of the empire? To put such a question to a Turk in Turkey might be almost as dangerous as to ask why a Turkish coin, nominally worth 80 cents, and that passes freely in the marts for 80 cents, will only be credited as worth 68 to 70 cents in the Turkish custom office, Turkish postoffice or other Turkish government office. A Syrian informed me that to ask why the government thus shaves its own money is to endanger oneself of imprisonment. In one of the principal streets of Stamboul, in the busiest part of the day, and in the midst of a busy crowd I saw two offi-

cers gag a man, lift him into a carriage and drive off with him to—who knows where? Our dragoman seeing that we were taking interest in this incident hurried us along to get out of what he seemed to think might be danger. The man looked like a peaceful, well-behaved citizen and no one seemed present to accuse him of crime The hospital connected with a Presbyterian mission in Turkey mysteriously took fire and was burnt to the ground. No one would say that the fire might have been the work of an incendiary, notwithstanding the fact that the time and circumstances made it difficult to surmise any other explanation. In a missionary school, remote where this fire occurred, the matron expressed anxiety about her own buildings, because of the fire referred to. Turkey may want medical colleges, medical hospitals and well trained physicians and surgeons, but aside from what is done in Constantinople, there is but little evidence that she does. As foreigners educate the lower classes into an appreciation of the value of these things the government reluctantly gives a half hearted approval and ostentatiously makes a pretense of being in the lead. Our missionary schools create the first demand. It is related of a missionary who was going into the interior of Turkey in Asia that he met a friend who questioned him regarding where he was going, and what he was going to do. His reply was: "I am going to P— to start two schools." "And why *two* schools?" asked his friend. "Oh! it is this way. Whenever I, or any other missionary, start a mission school, in a new place, the Turks soon discover that we are winning friends and at once start the second school." It is thus with hospitals and colleges. At present there are but few hospitals in Turkey. No other country needs them more. The number is not likely to increase if it is left to the initiative of the Turk. No other country will have them quicker if the missionaries can secure funds with which to make the start of a fair number. The Mohammedan authorities will

accept such gifts as the various cities in America accept the library funds from Mr. Carnegie. They add 50 per cent to the original investment in order to avoid the estrangement of their people from the faith of their fathers.

There is one thing that Turkey needs more than any other. That is trained nurses. Even the well-to-do people of Turkey are woefully ignorant on things medical. They know practically nothing about the proper care of the sick. They may call

Little Ahmet, cured at the hospital—A patient for the children's ward.

in skilled physicians, trained in their own excellent college at Constantinople, or trained abroad in the best institutions of Europe, or America, but after paying for the best of advice there is no one to see that that advice is carried out. It is morally certain that in many instances charms, incantations, or bead prayers to Allah will be substituted. They will carry to the nearest tomb of some great person, or the shrine of some Mohammedan saint, a rag torn from a garment of the afflicted, tie it to some part of the tomb, or a nearby tree, and return to the

sick one, expecting quick recovery as the result of this effort. They will have a string of 99 beads, in which each bead bears a different name for Allah. In a whining, singsong tone, they will "tell" these beads with great fervor, particularly as they go over the ones calling God "the healer," "the deliverer from pain," etc. To release the ailing from such superstitious thralldom the trained nurse has become a necessity. In thousands of harems no medical man can be admitted, however pressing the necessity. Multitudes of the best women of Turkey perish miserably under the ignorant care of untrained accoucheurs. When the doctor is called for advice—if he ever is—there is no opportunity to see the patient and no trained nurse to tell him the facts of the case, or to be guided by his directions. Female children of from 10 to 12 years of age get married and they and their sickly progeny are ever the prey of ignorance and superstition. An effort is being started to lessen somewhat this awful state of affairs. There is little hope of Turkey, as a whole, ever permitting male doctors to attend their wives in confinement, or to see these wives unveiled in the harem. They may be permitted to feel their pulses through a screen or examine them in full dress with their veils on, but not otherwise. On the meagre supply of facts thus obtained the diagnosis must be made. By the assistance of a trained nurse this could be improved, the latter supplying the doctor with data he cannot himself obtain. She would likewise be of great service in executing his orders intelligently. The reader may ask: "But why not supply female doctors?" The reply is that they are not procurable, and for many reasons too long to enumerate here, they are not likely to be procurable for a very long time to come. The educated medical man is there. The means of increasing the supply as required is also there. The trained nurse has begun to appear. The material of which to select such nurses is there and the hospitals in which she can be trained are on the increase. The female

practitioner will doubtlessly appear in due season, but the trained nurse must be her John the Baptist. The first of these evangels of the East I am, through the kindness of Dr. Carrington, able to show a picture of to FORTNIGHTLY readers. Turkish medical men long for the appearance of more of her kind. Under the guidance of Dr. Carrington a school for trained nurses is being established in Constantinople. The plan for an American Hospital, designed as a training place for nurses in that city has been drawn by A. D. F. Hamlin, of Columbia Univer-

Anatolia College Hospital, Marsovan, Turkey.

sity, New York. The hospital where most of the doctor's work has been done, where the first trained nurse has been at work, and where he conceived the idea of his new Constantinople hospital, is at Marsovan. Pictures of the interior and exterior are given, and also a picture of a grateful Turkish father and his cured child. For the proposed new institution at Turkey's capital young lady students are already being received, first among these being a Miss Eunice P. Kalfa. They are, of course, selected from among the

graduates of the different missionary schools. The training of the average girl of Turkey, whether Christian or Mohammedan, is adverse to her becoming either a trained nurse or medical woman. They have all been instilled with the notion that to do work for others is degrading. It is very hard to drive this notion from their heads. The missionary schools seek to teach them that, on the contrary, such work is honorable. Not until they have taken this lesson to heart are they available. American medical men must, I am sure, wish Dr. Carrington great success in his noble effort. If some rich American would imitate C. Roberts, of New York, who in 1863 founded the Roberts College, on the Bosphorus, near Constantinople, and endow the American Hospital with a liberal sum it would certainly be a commendable act. Perhaps such a one will soon appear.

EGYPT AND THE EGYPTIANS.

To the average medical man the name of Egypt calls up the plagues called upon that unfortunate country by Moses, when Pharaoh refused to let Israel go. To the invalid, sent there by his family doctor who has heard that it is a good place for rest and recuperation, the hope of rehabilitated health buoys up his heart and makes him cheerfully submit in that country to conditions that he would expect to kill him at home. To the physician who has been there and given some attention to its climate and character, it appears to be a rather inhospitable spot for sufferers with any form of ailment. Hotel life, in any country, is hard upon the invalid, but hotel life in Egypt is particularly so. Night is made hideous by noise, mosquitoes murder sleep, flies drive to distraction during the day. The Egyptian fly can only be commended for his persistence, a quality he has perhaps gained by long residence here, as the progeny of those sent by Moses to plague Egypt. One of them is a match for any dozen American flies, in its determined effort at getting into the eyes and torturing the scalp of the bald-headed. Their dexterity at avoiding the victim's efforts at driving them away is phenomenal. Their numbers around butcher shops, bakeries, sweetmeat stores, and places where food is kept, or cooked, can fully account for the Arab's immunity against typhoid fever. The way they cling around the eyes of the natives, and the way these natives tolerate this nuisance, are equally astonishing to the medical tourist. It is a common thing to see a baby with half a dozen of them feeding upon the exudate from its eyes and so accustomed have these babies become to this form of annoyance that they rarely make the slightest effort toward brushing them off. Even the mothers stand by watching the pests, yet rarely try to relieve the little ones. It is all to them

but "kismet"—fate, to which they must religiously submit. Can any one wonder, then, that there are more cases of ophthalmia in Egypt than in any other country? Why should it be at all strange that along the Nile there are more blind people than elsewhere on our globe, in an equal population? While these babies, along with myriads of their elders, are perishing constantly from the effects of food that has become infected from the feet of flies, their immunity through natural selection is very great, as compared with that of the children of European residents. It is common knowledge that the latter die so frequently that it is almost impossible to rear one in that country. And why should it be otherwise, with diarrheal diseases so common, flies so numerous, and all sorts of food so fully exposed to germ inoculation? There, as here, the autumn is the fly season, and then death's harvest is a most bounteous one. It is particularly so toward the end of the autumn when these flies have had a fair opportunity to get in their work of sowing and the food has had time sufficient to multiply toxins, and germs, to the poisoning point. The great bulk of the people of Egypt being Mohammedans there is necessarily more faith in amulets, charms, and offerings at the graves of saints, than in medical care or skill. Upper Egypt is much more wholesome than lower Egypt, and this is probably due to the fact that the climate is dryer, flies get less chance to develop in moist food, mosquitoes are less numerous, and less left-over food is consumed. Rain storms are relatively much more frequent in Lower than in Upper Egypt. Around Thebes and Luxor they have an average of about one rain storm every four years. Be the people, therefore, ever so careless with food neither flies nor germs get a fair chance to develop in such a climate. Only during the Nile floods is there moist food in sufficient abundance for them to multiply upon. Then even Upper Egypt is attacked by dysentery and typhoid fever, as well as malaria. It is a remarkable

fact that the Arabs suffer much less from the two former than do Europeans. Ages of exposure to large doses of the germs has given them a considerable degree of immunity, but even they are not perfectly immune.

Tuberculosis is less common in Egypt than in most other countries. One has only to consider the nature of the bacillus of tuberculosis in order to see a reason for this. The great heat, long drought, and excessively strong sunlight of the region are all antagonistic to such germs. These forces destroy them as fast as they develop, and they can, therefore, get no foothold. All the hotels of Egypt supply mosquito netting, on the beds of their guests, to protect them from inoculation with the hemomoeba malaria. Unfortunately such protection is a mere delusion. Servants cannot be depended upon to look after these nets and keep them in order. Small holes soon appear in them, and then they become mosquito traps into which gather great numbers of the pests. In not a single hotel in which we stopped, from Port Said and Alexandria to Assuan, did we find a single sound mosquito-net on any bed supplied They were all worse than no net at all. Every night, before retiring, it was necessary to find these holes, pin or sew them up, and then begin the extermination of the flying squatters who had pre-empted the bed in advance of us.

Hydrophobia is an exceedingly rare disease in Egypt, notwithstanding the fact that, like Turkey, it is a great place for homeless dogs. It must have at one time been quite common as the Coptic prayer books contain a prayer for those suffering from this affliction. That no such prayer would have appeared there had the people not been quite subject to this disease, goes without saying. The extermination of all dogs that became affected has evidently through natural selection, rid the country of this danger.

Plague and cholera are occasionally brought here, and it is suspected that they come by way of Mecca during the pilgrim season. During the first week in January,

when I passed through Ismailia, on my way to Cairo, quite a number of cases of plague were reported as being found in Ismailia. No attempt at quarantine of travellers was resorted to. People came and went, into and out of the train, at this station, without let or hindrance. British health officers seek to isolate the patients and not the general public in such emergencies. It costs very much less, is more efficient, and it does not produce a feeling of panic that is destructive to common sense and justice. Ismailia is in the land of Goshen of the Bible, and is the place where the Israelites resided when Moses asked Pharaoh to let them go to their promised land. The presence of plague here was a reminder of Moses'means of constraining Pharach, on that memorable occasion, but whether any of the forms of plague then introduced were in any way like the present epidemic no one knows. The oldest known record of any general epidemic of disease resembling plague was found in Egypt and occurred in a region into which I was going when I passed through Ismailia, i. e , Memphis.

Tourists who visit Egypt all take the greatest interest in Cairo, its queer streets, its strangely costumed people, its citadel, its tombs of the Mamalukes, its Hamzowee bazaars, its mosques, its whirling dervishes, its camels and dromedaries; its men who drop down in the streets to pray at the call of the Muezzin; its veiled women whose noses are covered with a gilded word-symbol pronounced zet, meaning the sacred pillar of Osiris, the ancient god of Egypt, and the annual parade of the sacred carpet before it is borne off to Mecca. Few of them think of, or care about the history of the stones that have been used in the construction of these streets, bazaars, mosques, tombs or citadel. Almost every stone of any value in the construction of this city was once a part of a far greater, far more populous, and far more magnificent city than Cairo is ever likely to be. Its tombs are still the wonder of the world, and although mil-

leniums have flown past since they were built and hewn, they show no decay and sad neglect as do the tombs of the Mamalukes. The mosques and city walls are but beggarly representatives of the original walls from which their stones were taken. The golden symbol with which their women hide or embellish the upper part of their faces, is a persisting vestige from that far older city, and, strange to say, in defiance of Mohammedan bigotry and Mohammedan iconaclasm; woman's conservatism has preserved it through all these tens of centuries. That old city and this old symbol were of exceeding great interest to me, as a medical man, and are likely to prove of greater interest to the medical men of the future than to those of today, because more is likely to be discovered concerning them that will have an important bearing on the history of the evolution of medical science.

BIRTH-PLACE OF MEDICAL SCIENCE.

The city to which reference is here made is Memphis. Chief among my reasons for wanting to see Egypt was that I might see Memphis, the birth-place of medical practice and of medical science I had, some weeks before, gone far from the beaten path of ordinary touring in order to make a pilgrimage to Epidaurus, in Greece, where I could see the largest temple ever erected to any physician in this world, and where I could sleep at the foot of Mount Tithion where Esculapius, the god of healing, was said, by the Greeks, to have been born. After looking at the immense ruins of that still more immense ancient hospital, that stood in a lonely, wild spot, at the foot of that mountain, my desire to see Memphis, in the light of the newer knowledge of the source from which Greece borrowed its medical lore, became intense. If to the little "Hieron of Epidauros," far away from any city, crowds could be drawn to get healed, and such crowds, how wonderful must have appeared to be the success of these priest-physicians. I took the trouble to estimate the seating capacity

of what remains of the amphitheatre where hygiene was taught, and, without the slightest crowding, there was room for over 30,000 human beings. Think of even 20,000 patients at a time going to such a place to be healed, and think that from here sprang, by direct lineal descent, modern, orthodox medical practice, and then the reader will not wonder that I enthused over the prospect of being able to trace the source of this illumination still farther back into the depths of antiquity. In Epidaurus I gazed upon the treatment practiced nearly three thousand years ago. In Egypt I had come to see the spot where some touring investigators had, at that remote period, looked back still another three thousand years, gathered the knowledge then still extant, and planted it in progressive Greece, where it grew to the dimensions referred to.

Egyptologists are sadly hampered in getting exact dates because of the fact that the ancient Egyptians had nothing equivalent to an Era by which to compute time. We have our Christian Era. The Mohammedans have their Hegira. The Greeks had their Olympiads. The Egyptians merely gave the names of their kings and the time they lived and reigned. Each king's time of reigning has to be added to the times of all the rest, in order to get the number of years back to any particular or important event. As overlappings and cessations occur they complicate the figuring and, because of this, different authorities differing in their results since some of them fail to observe overlappings or gaps. As regards the history of Memphis there is surprisingly accurate record back to the First Dynasty. Then the first real character who appears on the scene is Menes. His tomb was discovered by De Morgan, at Nakadeh, in 1897. He is said to have made Memphis the capital of Egypt and this, by some, is believed to be its founding. Mariette, the French Egyptologist, has figured out the date of this event as occurring B. C. 5004. Prof. Lepsius, by making allowances for possible overlappings in

a number of the reigning sovereigns, reduces it to B C. 3892, thus shortening the time about 1100 years, and thus allowing for every possible source of error in the computations. At the shortest, the time back to the founding of Memphis is, therefore, about 5800 years. From this time down to the second Persian conquest, in 340 B. C., there is an almost unbroken record of thirty dynasties, each of which was represented by many successive kings. During its entire early history there was worshipped at Memphis, as a trinity, Ptah, Pakt, and Imhotep. Ptah, the father, was the chief god and was identified with Osiris, the prototype of Zeus among the Egyptians. Imhotep, the son, is of interest to medical men, inasmuch as the Greeks identified him with their own Esculapius. As this trinity came down, in mythology, from a period far before Menes, and far before any history, the remoteness of the antiquity of Imhotep must be exceedingly great. The civilization represented by Memphis, and by its possible predecessor, Abydos, could not have grown in a day. The splendor, wealth, national cohesiveness, and religious tenacity of those times must have taken ages to develop Their having no written language kept us from knowing anything about the steps of its growth. It certainly must have extended back for millenniums before Menes, or else the evolution occurred at an unparalléled rate and in a miraculous manner. However, this mythological god reaches us as the *first bearer* of the message of health to the ailing, that we have any record of. Leaving him aside and only considering real historical characters, we find that Menes' immediate successor on the throne, Athosis, was not only a physician, but also a medical author, having written a work upon anatomy. Quotations from what is believed to be one of his books, are found in a medical papyrus in the Museum of Berlin, of the time of Rameses II. It declares that the quotation was taken from a papyrus of the First Dynasty. In Athosis, then, we discover the first human being who

is recorded as having taught anatomy and practiced medicine. This was over 5700 years ago, and the stones that were used in the building of the city in which he lived, reigned, and taught, are now found in the walls of the buildings of Cairo. If those stones could only speak and tell us of the many strange things they have seen men do with in that long period that has elapsed since they were first taken from their quarry, what an interesting story it would be.

In order to reach Memphis, from Cairo, I went to the pyramids of Ghizeh, accompanied by an Arabian dragoman, and there we took camels and rode across the edge of the Libyian Desert. Passing the pyramids of Sakkara we finally reached the Apis Mausoleum, or Serapium, where we stopped to rest and look at these strange remains of the superstitions of this ancient people. The ride was about twelve miles. The pyramid of Cheops and the Sphinx were among the first things passed on the way, when leaving Ghizeh. All of the twelve miles over which we went was really the ancient grave-yards of Memphis. The pyramids are all tombs. The Necropolis of Sakkara is filled with multitudes of sepulchres of many kinds. It alone is from four and one-third miles long to about one mile wide. The Apis Tombs are hewn in solid rock, as subterranean chambers and passages. Their aggregate length is nearly 1300 feet, 10 feet wide and 17.5 feet high. The keeper supplies tourists with candles and accompanies them through the chambers. The temperature, however cold or scorching hot it may be outside, never exceeds 79 deg. F. within. They were discovered by Marietta, November 12, 1851, after being closed for a period which he estimated to have been at least 3700 years. He says: "The finger-marks of the Egyptian who inserted the last stone in the wall built to conceal the doorway were still recognizable on the lime. There were also the marks of naked feet imprinted on the sand which lay in one corner of the tomb chamber." Each side chamber is about 26 feet high

and contains an immense coffin, 13 feet long, 7 feet wide, and 11 feet high. Most of the coffins are made of beautifully polished red, or sometimes black granite, that was evidently brought from Assuan, over 250 miles up the Nile. They are all hollowed out, like ordinary coffins, and each weighs about 65 tons. There were sixty-four of them, and the date in which the sacred bull was placed in each was marked thereon, so that they became a means of confirming other dates found elsewhere in Egypt. On reaching the site of ancient Memphis little can be seen to tell of its past, or to give the slightest conception of its former greatness. Fields, farms, and a couple of Arab villages, occupy the place. Two large statues of Rameses the Second lie prostrate and broken as well as partly buried in mud. They give one a slight idea of where the great temple of Ptah stood, and around which the city spread.

From here came to all the world Egyptian religious ideas, Egyptian science, the Egyptian art of healing, and to this spot we must trace the germs of every step in modern civilization. As the amoeba has given us the data on which to build a scientific physiology so a correct knowledge of Memphis, at its glory, would give us the means of reconstructing the knowledge of how we gained our own greatness. All the suggestiveness that has led to progress arose here. The modern world, proud of its triumphs, seldom stops to think of the fact that every new idea and every new discovery comes, as a growth, from pre-existing ideas and pre-existing discoveries. All things—from ideas of babies, rattles, or from philosophies to Krupp guns—are linked together by the eternal law of continuity. Let us look back for a moment and see some of the elements of our own civilization and our own thought that now gleam among the rubbish of antiquity. Look at these embalmed dead and the embalmed sacred bulls and learn that they tell of an Egyptian belief in the resurrection of the dead. Look at the sarcophagi of some of the kings and see where their winged

spirits are shown as coming to rest upon their preserved bodies, and learn of their belief in a spirit world. Look at their symbol of life, which nearly every god carries and that was worn as a golden jewel by the people of ancient Egypt, and what is it but a handled cross? Indeed it is sometimes made in the image of a man with outstretched arms and the head representing the top of their cross. It was the most sacred symbol of ancient Egypt before Abraham was born or Joseph had been sold by his brethren into that country. Look at their national and city trinities and learn that they believed that there should be three persons in every godhead. Interpret these things as we please, but they are there. The evolutionist can say that the Everlasting Power that created man put them into the minds of these people. The creationist can but believe that they are vestiges of the early beliefs of Adam, or Noah, handed down, in mutilated form, as silent prophecies of a future. Visit, as I did, Karnack, Luxor, the tombs of the Kings of Thebes, and Phylae, and then doubt, who can, the progress in science and in art made by this ancient people. The architectural glory of the cathedral of Cordova overwhelmed me with astonishment at its effective beauty, but all the grandeur of Cordova's fane shrivelled into insignificance at the sight of the great Hypostyle Hall, of the Temple of Ammon, at Karnak. There is nothing comparable to it in this whole earth. The library ceiling, in the same temple, tells something of the astronomical knowledge of those times. The carved, cut, and turned granite, of all sorts of sizes and shapes shows that they knew how to use edged tools and accurate turning lathes. They had diamond rock drills for hollowing out their granite sarcophagi, and the means of polishing the hardest kinds of stone. Their drawings, articles of jewelry, sculptures, and a multitude of things, that can be seen any day in the museum at Cairo, are the most convincing evidence of technical skill and knowledge of

a very high order. Their knowledge of arithmetic, geometry, engineering and mechanics show that they must have had schools and colleges of a high degree of merit. They divided the year into 365 days, and had additional days, similar to our additions during leap years. They had the zodiac with its twelve signs, the year with its twelve months, and the circle with its 360 degrees. They made glass ages before the Phoenecians who were long credited as its discoverers. There are drawings in their tombs depicting glass blowing and glass manufacture much like that of today. They vitrified pottery in color and the potter's lathe, depicted in their drawings, is almost exactly the same as that used today. They had blow pipes, delicate balances enclosed in glass cases to protect them, chemical forceps and quite an extensive knowledge of chemistry, as well as metallurgy. They manufactured gold leaf, and I saw some gilding at Sakkara that looked as fresh and pretty as if it had been put on but yesterday, yet that gilding could not have been less than 4500 years old. In the Bibliotheque National, Paris, is a papyrus found by M. Prisse d'Avennes, in an Egyptian tomb of the 11th dynasty. It consists of eighteen pages, unequalled for size and beauty of characters, written with black ink—bold, round and cursive It has been called the oldest book in the world, and its characters are declared, by competent authorities, to be the prototypes of the letters handed by the Phoenecians to the Greeks, by the Greeks to the Latins, and by the Latins to us. Our alphabet, then, was born in Egypt as a modification, through slow degrees, of the Egyptian hieroglyphics. While most of the other people of our globe subsisted chiefly on rice the Egpytians have always preferred wheat and, from ancient Egypt, we have not only got our seed stock of wheat, but our habit of making wheat bread the staff of life. Before Troy was destroyed Sesostris, king of Egypt, cut a canal between the Red Sea and the Mediterranean, cut through the Eastern branch

of the Nile. The canal entered the river where Haroun stood. De Lessep's Suez Canal is, therefore, but an imitation of this far older piece of engineering. During the reign of Darius large ships passed through this ancient canal that afterwards, through neglect, was filled up with drifting sand. In medicine they are known to have used opium, senna, and a number of mineral remedies now resorted to. That they knew of the antiseptic power of certain substances is attested by the way they embalmed the dead. Myrrh, cassia, aromatic gums, bitumen and a combination of carbonate, sulphate, and chloride of sodium, that was known to the Greeks as Natron, constituted the materials chiefly used. The most expensive but best means employed, was by using aromatic gums, while the least expensive was by using natron. Perhaps the most wonderful, among the many wonderful things that has come to us from Egypt, is the knowledge of the shape and size of our earth. Biased by the ignorance of the Dark Ages in Europe, we have been led to look upon the knowledge of the earth's shape and size as a modern discovery. Most of us have tacitly credited Columbus with the discovery. What are the facts? Eratothenes, librarian at Alexandria, 250 years before the birth of Christ, measured the sun's shadow on June 21st, at Alexandria, and discovered that it cast no shadow at Assuan on the same date. Using still more ancient Egyptian geometry on his problem he discovered that as the distance between the two places was 500 stadia, and the shadow thrown at Alexandria represented 11 degrees of the circumference of a globe, he calculated that the earth's circumference was equal to 25,000 of our miles. His method of making this measurement is the method still pursued by astronomers in getting at the same results. In jurisprudence the ancient Egyptians, in some ways, excelled us. They permitted women to earn property and own it in their own right. They allowed women, in the absence of male progeny, to become reigning queens. They

gave to women the right to teach, to preach, or make a living in any honorable manner. A judge who condemned an innocent man, or one who allowed a clearly guilty one to escape unpunished, was held as a criminal before the law. Interest on a debt was never allowed to exceed the principal. There was no imprisonment for debt. Not to pay a debt was to be excluded from burial in the family plot, and the consequent disgrace that followed such exclusion. Any one, even a convict, could bring charge against a dead person and, if the charge was sustained, decent burial was forbidden until his friends righted the wrong. This applied to kings as well as to the common people. Deserters were punished with disgrace and not with death. Women were protected from molestation by the most severe penalties. Doctors who proclaimed the discovery of some wonderful cure were held responsible for the effects produced by that cure and, if death resulted from its use, the doctor, or quack, had to follow his victim to the "nether world." In the prayers and confessions, which many of them committed to papyrus, they display the high ethical tone of those remote times. Here is the translation of one that is over 4000 years old: "I have not boasted, not lied, not stolen, not defiled myself, not burned with rage, not blasphemed, not been an eavesdropper, not oppressed the poor, not starved any man, not made any to weep, nor have I falsified the beam of the balance." The papyrus of Ani, in the British Museum (No. 10,470) gives forty-two sins that every devout person had to confess concerning before Osiris, or lose his soul. Besides those of the confession quoted were others equally remarkable, such as: "O Breath of Flame, I have spoken no evil; O Lord of Law, I have never entered into a conspiracy; O god of two-fold evil, I have never committed adultery; O reciter of words, I have never spoken in hot anger; O Babe, who comest forth from Uab, I have never made my ear deaf to the sound of words of truth; O thou that orderest words, I have

never been an excitable and contentious person; O Lord of aspects, I have never been precipitate in judgment; O thou who veriliest mankind, I have never blasphemed God." Every one of the forty-two confessions, of these prayers, was believed to be verified by forty-two guardian angels (gods) at the judgment seat. The heart, too, was weighed, by the angels that stood round the throne of Osiris, so as to further confirm the truth of the confession. In the Tombs of the Kings, at Thebes, the walls are decorated with drawings of this judgment, showing even to kings, that the justice of Osiris follows them into their graves.

HONOR BELONGS TO AN ENGLISH PHYSICIAN.

How came we to possess all this knowledge of ancient Egypt? Who was the genius that unravelled the mysteries of the hieroglyphics and gave us entrance into this, the most remote antiquity to which man has ever penetrated? The readers of the MEDICAL FORTNIGHTLY must, on learning that it was a medical man, feel the more proud of their profession. But for this fact I would not have inflicted upon them so much information about that remarkable country, as it seems so foreign to medical matters and, therefore, apparently out of place in a medical journal. In 1799, a French soldier stationed at the town of Rosetta, in Lower Egypt, discovered a slab of basalt that was covered with several kinds of strange characters. A little later and it was captured by the English, during an engagement with the French. The English soldiers sent it to London where it was placed in the British Museum. There it was studied by Dr. Thomas Young, professor of natural philosophy at the Royal Institution, and physician to St. George's Hospital. He was then one of the best posted linguists in London and, as the Rosetta stone told its story in three languages—Egyptian hieroglyphic, demotic, and Greek, he was able, at once, to decipher the Greek, then the demotic and, finally, by hard study, the Egyptian. Many

other persons have since acquired the knowledge of how to read the hieroglyphics, so that the evidence of the correctness of such readings is perfect. Where Greek and Egyptian history overlap the most thorough accordance expected has been found to exist. Much of what has been discovered corroborates a large amount of Bible history. No competent person has now the slightest doubt of the practical accuracy of Egyptian history, as revealed by the hieroglyphic records, and the whole world owes a debt of gratitude to Dr. Young for this wonderful piece of work. He was born at Milverton, Somersetshire, England, June 13th, 1773; graduated M. D. in July, 1796; died May 10th, 1829. His parents were both Quakers.

THE ISLE OF SPICY BREEZES.

CEYLON AND ITS ODD CUSTOMS.

Ceylon—Bishop Heber's "isle of spicy breezes"—is just half way around the globe from central Kansas. Colombo and Dodge City are on almost opposite parallels of longitude. When an American tourist lands at Colombo he feels as if he had spanned about half the globe. Should he try to judge of his whereabouts by the novelty of his surroundings he might be tempted to picture himself as having reached another planet. Everything is new, strange, startling. The waiters in his hotel he takes to be young women, and is astonished on learning that they are young men. Their looks and dress, even to the way they wear their hair, is, to the freshly arrived American, evidence that they must be women. He goes into the streets and encounters other women-like men, but as some of them have beards he begins to realize that Singalese ways are not as our ways. These hatless men wear their hair done-up with combs, have skirts on instead of pants, and their upper garments are much like those worn by European women. To see them, with their large tortoise-shell hair combs, and not to see their faces, is to be certain that they are women. When they are without beards their effeminate looks make it hard to be sure that it is a man instead of a woman that one is looking at. The garments of the men are much like those of the women, but the latter do not wear hair-combs and, where they imitate the Tamil women, their supplies of jewelry constitute a ready means of distinguishing them from their lords and masters.

The Tamil women are Hindoos by descent and are readily distinguished by the gorgeousness of their costumes and the numbers of their jewels. Their ears, noses, necks, arms, fingers, toes, wrists and ankles are covered with them. The noses and ears are slit instead of bored, in order to let in immense gold, or silver rings and these latter have pendants hanging all around them. Instead of being satisfied with one slit in the lobe of the ears they have three to each ear. One is at the top, one in the middle and one at the bottom. This mutilating must have been going on for milleniums and yet there is not the slightest evidence of any mark, indentation, or cut being acquired as a hereditary character. Because of the toe and ankle jewels the women go shoeless, stockingless, and short skirted. The priests wear orange-yellow garments, and these with the green, crimson, purple, white, and other colored garments of the laity, give the streets a rather gay appearance. The chief colors, however, are green, white and red. The coolies tread the streets clad in a loin cloth and their utter unconsciousness of there being anything undecorous in their conduct is evident from a survey of their faces. The children are nearly all living bronze statues, sans garments. The little daughters of the rich go around clad in silver or gold bangles. Around their little waists a silver chain is hung and this is strung around with little pendants, the center one being moulded into the form of a heart and takes the place of a fig-leaf.

Many Eruasians (European-Asiatic hybrids) are seen and they imitate the natives more often than they do the whites. The Singalese, Tamils, and the Eurasians are a very quiet, unobstrusive people. The contrast between them and the people of Egypt, Palestine, Turkey and Greece, in this respect, is very noticeable. They go about their business wihout noise, excessive gesticulating, or quarreling. They are exceedingly deferential toward tourists, and any little attention that white people pay them seems to be high-

ly appreciated. They appear to be very particular in trying to keep their person clean.

ABLUTIONS OF THE NATIVES.

Our first introduction to this phase in their character occurred at Kaduganawa station one morning when we had made an early start for a distant part of the island. Our train, being a mixed one, stopped to do some switching. The sun was rising as we approached the station and we were surprised at seeing three native women attending to their toilet by the wayside. One was a lady advanced in years, while the two young women were under 25 years of age. On the wooded hillside, not far from the track, there was a spring and from it they procured water, carrying it to the road in a small brass vessel which they had with them. They were taking turns at washing out their mouths and gargling their throats. They did not put the brass vessel into their mouths to take their supplies of water, but poured it first into the palms of their hands, and from thence into their mouths. When they needed a liberal supply they held their hands against their mouths, palms up, and then poured the water into the palm in a way that caused it to run into the mouth. The buccal ablutions must have been at least a dozen for each of them. After this was ended then began the washing of their heads and faces, the water always being conveyed to their persons through their palms. After the faces and heads were washed the noses came in for liberal ablutions, internally. They sniffed the water up and spat it out by the mouth. This finished, the mouths had to be again washed, rewashed, and re-rewashed. Now it was the turn for the feet and these were gone over many times before the fair ones seemed to be satisfied with the job. But next came a new surprise. We thought the mouths had been so thoroughly washed that they would need no farther attention that day, but, no, they had to be washed again. In ejecting the water from their mouths they seemed to do their best to try and send it

as far away from where they stood as they possibly could. Now we thought that surely their toilet would end, but it had scarcely begun. The lower limbs, up to and beyond the knees, received due attention in spite of their being in a public place. They next dropped their single garment down over these limbs and tied it around their waists while they proceeded to cleanse the upper parts of their bodies, but, first, however, giving their mouths a few more turns of intaking and ejecting of water When they had finished they drew a fold of their garments over their right shoulders, fastened them in place, and, with the left arms and left sides bare, proceeded on their ways together This was the type of full morning dress for that part of the country.

A QUESTION OF PROPER DIET.

We had still another illustration of the habits of the people of this island, in which they differ materially from us. On our way to Nuwara Eliya, the sanitarium of Ceylon, we had as a fellow-passenger a reverend gentleman of the Tamil race. The Tamils were the conquerors of the country before the advent of Europeans. They came from Hindostan many generations ago and are quite numerous here. I got into conversation with him and among other things he told me of his visit to the bishop of his church, who is a white man living in Kandy. He spent a few days as the guest of the bishop and his family. He was lavish of his praise of their great kindness. They had tried in every possible way to make his visit a pleasant one, but he confessed to me that he was glad to get away because he was hungry all the time he was with them. They supplied him with wheaten bread, chicken, fish, cake, pies, and all the good things that the lady of the house could think of, but without avail. He would have starved if he had remained. Nothing he ate satisfied his longings for rice, gram and curry. They had none of these, and he could not make a satisfactory meal without them. It never

occurred to them that what was good for them was totally unadapted to the requirements of their native guest.

How often have I seen this kind of a blunder made by medical men in trying to care for their patients. The doctor, being fond of wine, prescribes it for a stomach to which it is an abomination. How few are the physicians who stop to think that ages of natural selection must have taught the stomachs of their patients the needs of their bodies a thousand times better than any rule of thumb could devise, or the likes and dislikes of the medical attendant could determine. If an ox could be taught medicine there is but little doubt but that he would order hay, or oats, for all on whom he might be called to attend, even if some of them were carniverous creatures. Rice is the mainstay of almost all Asiatic races. To them it is the staff of life and it is with the utmost difficulty they can do without it.

MOSQUITOES AND THE RICE FIELDS.

Right here is one of the greatest problems that the medical world has yet to face. Not until I reached Ceylon had I the slightest appreciation of the difficulties or of the magnitude of the problem. Filled with enthusiasm over the grand discoveries of Laveran and Ronald Ross I had come to think that we would soon be on the way toward the extermination of the anophele and to the redeeming of the richest part of the earth to civilization. Ceylon has almost disillusioned me. Since I have seen just how rice is cutlivated and learned how essential rice is to the comfort and health of more than half of the human family my dream of the subjugation of the tropics has almost vanished. To see the so-called "paddy" fields and watch the natives at work in them is to learn that mosquito extermination is likely to require milleniums of time. Every paddy or rice field is a breeding place for these pests, and in order that Asiatic people shall obtain the kind of daily bread which they require, by far the largest proportion of soil culivated for any one crop

must be kept under water as a shallow swamp. This is just the kind of places in which culex and anophele thrive. It thus happens that an exceedingly large part of every tropical and semi-tropical country, in the Eastern hemisphere, must be devoted to the breeding of mosquitoes. No kerosene treatment can be applied to such soil, because of its effects upon the crops and on the peasants who have to do their work by standing all day long, day after day, for weeks and months, almost to their knees in mud and water. Crop succeeds crop in rotation so that the water is incessant. While one field is ripening another is being planted, and still another plowed. The planting is done in the same manner as our farmers plant cabbage. The seed plants are first grown in one field and these then transplanted in rows in a different field. All this planting, plowing, transplanting, etc., is done in water and mud. At no time in the year is there an absence of ponds for mosquitoes to develop in.

Nor do the paddy fields complete the list of sources of danger. Where rice is the staple article of diet the ordinary rain supplies of moist climates is not enough to meet the requirements. The irrigation needs necessitate the storage of water in immense reservoirs. These are known in Ceylon as "tanks," and at one time the island was so thick with them that their remains can be found now in every direction.

Even the vegetable world conspires toward the production of unhygienic conditions. In the deepest jungles and forests innumerable pitcher plants and other plants with water storing contrivances can be found where mosquito eggs batch in great abundance. When we fairly weigh all of these facts it does not seem possible that, by any human effort, the production of tropical malaria can be materially lessened.

THE GENUS LEMNA.

I can at present see but one ray of hope in this direction. Major Aide, of the British army, after a careful investigation of the

conditions governing the development of Culicidae in Hindoo tanks, makes the unqualified statement that wherever he has found a tank the surface of which was covered with Lemna minor (lesser duckweed), no mosquito larvae, or eggs, could be found. He examined other tanks at the same seasonable times in the year as he investigated those with the weed and in every instance he found eggs and larvae of these pests when the Lemna was not present.

Nature, the English scientific journal, in commenting on Aide's statement, assures its readers that other species of the genus Lemna, besides minor, have apparently the same marked effect on the frequency of both Anopheles and Culex in Great Britain. If we can rely on these statements this constitutes a discovery second only to that of Major Ross, made in the same country (Hindostan). The genus Lemna, strange to say, is one of only a few plants that exists in every part of the world where mosquitoes are a menace to man. Lemna minor is quite common in nearly every section of the United States where there are ponds. If it is the natural enemy of the mosquito this fact should be come universally known and every effort should be made to favor its spread, particularly in ponds where mosquitoes lay their eggs. By the aid of Lemna and by the educating of the public into a knowledge of what the mosquito larva looks like, it might be possible to materially restrain and, finally, exterminate these carriers of disease. This, at least, seems at present to be our only source of hope for the future advancement of civilization into the fairest and richest agricultural parts of our planet.

Let the cheap labor of the Orient be employed in scattering the seeds of Lemna and collecting and destroying the larvae of mosquitoes, and land that is now given over to crocodiles, pythons, ticpolongos, and cobras, as the most choice parts of Ceylon now are, may soon become the best parts of the earth.

EVIDENCES OF ANCIENT GREATNESS.

At one time it was far more densely populated than it is today. Two such immense cities as Pollonarua and Anuradhapura, with the myriads of scattered ruins of tanks, dagobas, monasteries, and canals show what the Isle of Serendib, so frequently referred to in Sinbad the Sailor, once was. What has become of its millions of people? I spent a couple of days riding and walking through the deserted streets of the ancient northern capital and was astonished at the still remaining evidences of its former greatness. The cleanly habits of its now silent multitudes is in full evidence among the thousands of stone bathing cisterns scattered through every street. For nearly 120 years a surging mass of human beings came and went within the sacred precincts of this holy city of Buddha. For 2150 years the sacred Pepul, or Bo tree (Ficus religiosa), has been faithfully guarded by a band of yellow robed priests. One generation comes and another goeth, but still a group remains to look after the interests of this sacred object. It was planted here when Buddhism first came, and the unbroken record of its genuineness makes of it the only tree in the world historically known to be of such great age. The tree of which it is said to be a branch, grew in Saranath, India, and under it the faithful believe, the Lord Buddha, as Gautama, meditated, while seeking to attain Nirvana. When the priests planted it in this spot they had no idea of the fitness of soil and climate that they had chosen for this particular kind of tree. Its hygrophylous leaves, with their long, dripping points tell the story of its geological development in an environment of moisture such as that found at Anuradhapura. Had this city been half as well adapted to human beings, as it was to the sacred tree of Buddha, a dense population would probably have remained with it throughout its history.

The Singalese must have become well acclimated to this region, but to their conquerors, the Tamils, it was death. They

could endure Kandy, but neither of the ancient capitals were suited to their needs. Disease and death lurked in every swamp, and even in the irrigation tanks that surrounded them. The palaces, the monasteries, the dagobas were all left to the riot of tropical vegetation which soon buried them in the depth of a jungle. A few lonely monks remained to watch the maw of time eat up the ancient splendor. Many of the relics were removed from the dagobas and carried to the Buddhist temple at Kandy, and while

Hindoo Temple, Colombo.

many more must still be there, hidden away beneath those great, masses of brick, the latter city has divided the attractions for the pilgrims who come to this Mecca from China, Japan, Korea, Burmah, Siam, Thibet and Java.

THE SACRED MOUNTAIN.

The sacred mountain—Adam's Peak—likewise has great interest to these people as they consider it the spot from which Buddha ascended to heaven. They point to a hollow spot on the top of the mountain as where he left his foot-print at the time of this ascent. This, however, is contested by the Mohammedans who assure the visitors that it is the mark of Adam's foot when he landed here after his expulsion from the Garden of Eden.

Around Adam's Peak and around Nuwara Eliya mosquitoes are few and the climate wholesome. Hakagalla, the site of the government experimental gardens, is near the last named place.

TYPHOID FEVER INFECTION.

On the hills, facing Hakagalla, the Boer prisoners were kept and it was here that British medical men had the truth so forcibly driven home to them that there are other far more dangerous carriers of typhoid fever, betimes, than water. All the prisoners were kept corralled by themselves within a barbed wire fence through which no one was allowed to go. A guard of armed men was kept constantly around the outside of this fence and no one was allowed to go within several feet of the prisoners. Contact between soldiers and prisoners was impossible. Food was passed to the prisoners through the fence. Their water, as well as the water for the soldiers, came from a spring far up the mountain. It came through metal pipes directly from its source and was, therefore, absolutely beyond the possibility of infection. Only condensed milk was permitted to be used by either soliders or prisoners. Every soldier who left the camp to visit Nuwara Eliya, or other surrounding town, was compelled to carry with him a canteen filled with the spring water for use while away. For months they all enjoyed the best of health.

In December a new lot of prisoners arrived from South Africa. Among them was one sick with typhoid fever. He was taken down in the ship, after leaving Cape Town. In about three weeks after his arrival others of the prisoners became sick and it was soon discovered that they too had typhoid fever. Steadily the number of cases increased, and it soon began to appear among the soldiers. The first of these attacked were the men whose mess was nearest to the barbed wire fence. Although several rods away the infection seemed to cross that fence. The only living things that had gone through there, in all that time, were the flies, and their name

was legion. The tents were, betimes, black with them. They visited the latrines and from there flew to the mess rooms where they walked all over the food of the soldiers. It was not long before an epidemic of large proportions had developed. Their experiences thus paralleled our own during the Spanish-American war.

THE FLORAL GARDEN.

The experimental Garden is a most interesting place for medical tourists to visit, as is also the Botanic Garden at Peradeniya,

Cinnamon Gardens, Ceylon, Showing Eye Hospital.

near Kandy. The immense flowering trees, the mulitudes of beautiful palms, the varigated foliage, and the strange shaped plants that can be seen in these places, are an attraction to everybody. No one can look upon an immense Poinciana regia, in full bloom, and not be willing to confess that it is the most beautiful tree in the world; but it is not without close rivals. It is, however, well named "flamboyant," "peacock tree," and "forest flame." Its nearest rival in vastness of regal display is a vine that is known as Bougainvillea. There are several species of it. They climb far up on flowerless trees decorating them from root to summit, usually in a blazing mass of magenta.

THE MEDICAL PRODUCTS.

To the doctor the chief objects of interest are likely to be the cinchonas, erythroxylons, strychnos, cinnamons, camphors, cassias, cashews, cardamons, nutmegs, cloves, physostigmas, pipers, myristicas, etc. In passing he will also take a glance at the fields of coffee, tea, tapioca, and arrowroot, that are in evidence in many parts of the island. The cassia fistula tree, if laden with its rich canary-yellow blossoms, is sure to attract his attention even under the name of Indian laburnum. If at all interested in botany he will marvel at the vast numbers of Lugmenosae that appear everywhere, and he will be more surprised at seeing the natives mowing down miles of sensitive plants (Mimosa sensitiva) that cumber the roadsides as a weed. His garden, and flower-pot lantana, that he prizes so much at home, he will soon learn is detested here because of its abundance as a road-side and jungle plant. The jack-fruit trees, the bread-fruit trees, the pawpaws (Carica papaya and not the Asimina triloba or American pawpaw), the coco-nut palms, the travellers palms, and the toddy palms, will give the forests an exceedingly strange look to him, while the excessive numbers of epiphytes and parasites that weigh them down, will convince him that Darwin was right when he referred to the struggle for existence as the factor in bringing about changes in forms. If he wants to study plant diseases he can do it here to his heart's content, but if he is seeking to know a large number of human diseases there are many places where he would do better than here.

MALARIA AND DYSENTERY.

As has already been stated the chief scourge of this island is malaria, and next to it comes dysentery. It is a well-known fact that wherever malaria is very bad, endemic dysentery is likely to be almost or quite as bad. At one time the cause was believed to be the ameba dysenterica, but this is now contested. I am of the opinion that diarrhea and dys-

entery are symptoms of many different kinds of infection, and that it will yet be proven that amoeba, bacteria, and even the chemical constituents of soil, water, and food can cause their appearance.

Measles is the most dangerous of their so-called zymotic diseases. Smallpox, typhoid, whooping cough, and pneumonia are common. Tuberculosis is less common than in Europe; diabetes is prevalent, as is also cancer. At Hendala there is a leper asylum in which there are usually between three and four hundred cases. Diphtheria is rare and gout unknown. There are good hospitals, medical colleges and dispensaries in Colombo.

TOURING THE DECCAN.

NATURE has divided India into two grand divisions, the line of demarcation of which is the Nerbudda River. The Deccan, or "Country of the South," is, from a geological, biological and geographical standpoint, probably the most remarkable as well as the most interesting region on our globe, while the north country, from an ethnological viewpoint is, without doubt, incomparably, the most interesting. Few visiting tourists are familiar enough with science to appreciate these facts or to care for the bearings they are likely to have on the future beliefs and future destinies of mankind. It never occurs to them, when going through the Deccan, that here is the present battlefield between the believers and disbelievers of the great land of Lemuria, that is supposed to have occupied much of the present Indian Ocean. They travel over thousands of miles of country that constitutes one of the strangest geological sights upon this globe and never give it a thought or, save in the most superficial manner possible, even look at it intelligently. Here is found what Chamberlin and Salisbury, in their Geology, tell us is "The most stupendous outflows of lava recorded in the earth's history." Some 200,000 square miles of this region is covered with this lava to depths varying from 4,000 to 6,000 feet. It has been estimated that there is enough there to cover the entire dry land of the world to a depth of many inches. The outpourings of Vesuvius, Pellee, Heckla, Etna, Mauna Loa, Kileau, and all the rest of our modern volcanoes combined, are but insignificant squirts as compared with this. To see it is alone worth a trip to India. To see man's

efforts, in past ages, at utilizing these outpourings as defense in war and as religious retreats is of equal interest. The Hill Forts of the Deccan were at one time among the most impregnable on the earth.

THE FAMOUS CAVE TEMPLES.

The Cave Temples of this same region out rival everything of their kind on this globe. Every tourist in India hears of the cave at Elephanta, and rarely does one go through Bombay without visiting it. Few learn of those of Karli, Ajanta and of Ellora, and fewer still ever visit them because they happen to lie off the beaten track. That on the island of Elephanta is certainly well worth seeing, but the others are so far superior that it seems too bad that more travellers do not visit them. They are all artificial caves cut into the lava mountains by the hand of man. At Elephanta the early Portugese visitors played sad havoc with the beautiful columns at the entrance. In religious zeal they trained their cannons upon them so as to destroy such, to them, detestable evidences of paganism and idolatry. The Karli caves, being at a greater distance from Bombay escaped such vandalism. The principal one of these is four miles from the railway station and was excavated about 200 years before the Christian era. It is cut into the hard lava to a depth of 124 feet 3 inches and has a width from wall to wall, of 45 feet 6 inches. From the floor to the roof is 46 feet. The interior resembles an early Christian church. The side aisles are separated from the nave by fifteen handsome columns and at the extreme end is a dagoba or place in which were kept the sacred relics of saints. In front of the entrance are carved columns bearing figures of elephants, lions and images of men and women in ancient Hindoo costume. At Ellora so numerous are the caves that I found it quite wearying to try and see so many.

The Kailasa Temple is a marvel among these many marvels. Only the faintest kind of a conception can be given of it either

by word picture or photograph. Indeed it is difficult to realize, even when on the ground and looking at it, that the immense and highly ornate structure with its surrounding satuary, its huge and beautiful columns, its carved walls, its porches, its shrines, chapels and halls, its courts and squares, are all composed of but one solid piece of stone, and that that stone is still a part of the contiguous mountain. Those who cut it out had a collosal task to perform, and they did it well. Visitors to India who have seen Elephanta leave that country with an entirely false impression as regards what is to be seen at Ellora. Kailasa is in no sense a cave such as that of Elephanta. It is a magnificent structure standing out from the mountain of which it forms a part. It has been carved out into pinnacles and ornamental towers, galleries, doors, corridors, gigantic elephants, rock-cut screens serving as windows, etc. Immense stone flagstaffs rise from the square on each side of one of the shrines. The basement is covered with relief figures of elephants, mythological monsters and religous scenes. The central hall alone measures 57 feet by 55 feet and is surrounded by broad aisles and has large chapels outside of these. Stone bridges cross from the main building to some of the chapels, reminding one somwehat of the Bridge of Sighs at Venice.

Our tour of the Deccan included visits to Tutticorin, Madura, Trichonapoly, Tanjore, Madras, Poona, Lanouli, Karli, Bombay, Elephanta, Nassik, Daulatibad and Ellora. There were many other interesting points which we had planned to see in that region, but fearing the effects of the approaching hot weather we limited our sightseeing to these. Ellora was among the last of the places visited, although it is here referred to first.

TRAVELLERS AT MADURA.

After "doing" Ceylon we sailed from Colombo, on theBritish India Steamship Lama, for Tutticorin. The journey took about eleven hours. As there is no harbor at the

latter place, and as the coast is shallow, we had to disembark five miles from the shore and enter India on a small steam launch. After running the gauntlet of the custom officers we proceeded to the railway station to catch the earliest train for Madura. Having a wait of about three hours we filled the time in studying a motley throng of native travellers who were penned up within a fenced area awaiting the order of the health officers. There were about 500 of them, and as they had come from infected parts of the country they were not permitted to proceed on their journeys until they had been examined and found to be in good health. Out of the large number thus quarantined only a very few of them were on their feet. As there were no seats for them they were all contentedly resting upon the ground cross-legged, as tailors sit, and anxiously awaiting the orders for their release. A more kaledioscopic looking crowd could hardly be imagined. No farmer's wife every designed a "crazyquilt" that contained so many or so tortuously arranged an array of colors. There were turbans, dresses, and sashes representing every tint of the rainbow. A few were made of silk and a few more of wool, but the great bulk of them were cotton. Shiny brown faces surmounted with jet black hair and bejewelled with gold, silver, brass and colored glass ornaments were framed in vestments of red, green, blue, purple, magenta, orange and white. As they were all away from home they were, of course, dressed in their best. Many of the garments showed fading and the tell tale dirt of poverty, but most of them seemed to be fresh from the dyer's vat. But those brown faces were a study as well as a surprise to strangers. A very large proportion of them had their foreheads, and some their breasts painted in white, gray and red designs that indicated the religions to which they belonged. The Sivaites had four, parallel, white lines on their foreheads. The Vishnuites had a white mark, like a capital V, drawn at the upper end of their noses and in its center was a red line. Others had round

dots of various colors and of conspicuous size placed in the same region. Still others had somehting like the prong of a Neptune's trident painted on their forehead. The inner prong was usually of a red color. The worshippers of Kali had the entire forehead, and frequently their bared breast, daubed thickly with the ash of cow manure So prominent were most of these markings that the inevitable suggestion to an American mind was that of clowns in a circus.

THE NATIVE OPEN PALM.

On the arrival of our train we learned that it would be late ere we could get anything to eat. As there was a restaurant at the station I ordered a lunch sent out to our car Very soon a native servant appeared bearing a small package wrapped in paper. Its size brought up visions of coming hunger and I was about to return to the restaurant and ask for more. Soon, however, there came along another servant, then another, and another, and so on until nine of them stood before me, each with a minute paper package which he handed to me. On opening these I found one containing bread, another salt, another eggs, another butter, another meat, another cake, etc. Every man had a separate and single article, and every man was waiting for me to bestow "baksheesh" upon him for bringing the same, although I had paid for them to the keeper of the restaurant. No sooner did I put my hand into my pocket to get some change to bestow upon them than all nine of them opened up hands placed together, palms up, as a significant indication that they wished for large presents. All over India this habit of holding up the palms for a double handful is the usual greeting the tourist receives from a large number of servants every time he is about to leave a hotel.

TRAVELLING A LA PULLMAN.

When our train started curiosity led us to inspect its make-up. Every first-class carriage in India is convertible at night into

a sleeping car. Berths are let down from above, as in our Pullman cars. No bedding, however, is supplied by the railway company. Every tourist must carry his own bedding or hire a servant to carry it for him. Attached to the first-class cars are small compartments for servants, with an entering door into them, and here they ride at third-class rates. In hotels, railway stations, and in railway carriages there are no closets of the kind to which we are accustomed. They are all supplied with commodes and these are attended to by the low caste natives. This abomination is one that produces a sense of incessant discomfort to sensitive people, and is far from being free from danger to public health.

BRAHMIN ORTHODOX TEACHING AND IMPURE WATER.

Madura was our first stopping-place. There we had as guide a devout Brahmin, named Paraman Messer, who lectured us on the duty of faith, the nature of purity, and the meaning of idol worship. Faith, he informed us, was a duty we owed ourselves, and that like little children we should accept whatever the priest told us in the most unreserved manner. "How silly," he said, "we would have been if in childhood we had refused to accept what our teachers taught us concerning the alphabet. To have insisted in asking proof of why A was A and why it was not B would have made it impossible for us to have been taught to read." He assured us that water is purity itself and whoever drinks of the living water of holy streams or of the temple tanks purify themselves through and through. Just then I pointed to the temple tank, the Tank of the Golden Lillies, and seeing a crowd bathing in it and observing a dirty green scum over its surface, I asked him if that was "purity itself." For reply he filled a cup and drank, after which he refilled it and requested me to drink. He did not much relish my refusal and thought me a rather incorrigible pupil. I had, however, learned a most serious lesson of terrestrial hy-

giene, and one that I am not likely to soon forget. This peep into the mind of a Brahmin gave me the key to the unspeakably filthy habit of the average Hindoo. It taught me, too, how it happens that from this center radiates the fierce epidemics that every once in a while sweep over the earth. To believe that water is purity, however defiled, is to be willing to do all the strange things that I have since seen the Hindoos do. Never have I seen a people that tries so hard to keep clean and never one that is so disgustingly dirty. A day later it was my fortune to see one of them dip muddy water from a street drain and use it to clean his mouth and teeth, although he must have known that the putrid dejecta of men and beasts defiled it. It is a constant habit for them to stand over a well or tank, wash their bodies with the water, and let the washings run back into the same while others are drawing that water for culinary and drinking purposes. They even wash their mouths in the sacred tank out of which others drink.

TEMPLES OF SOUTHERN INDIA.

Of all the modern temples of Southern India only one at Nassik met my ideas of real beauty in architecture. Those of Madura, Tanjore and Trichonapoly are impressive when seen at a distance. On close inspection they are very disappointing. Every carved image is grotesque and untrue, more nearly resembling gargoyles than monuments or picture lessons. The people do not seem to invest them with any idea of sacredness. They sleep in them, loaf in them, eat in them, play games of chance in them, and occupy them as common marts for the sale of merchandise. Only the spots occupied by the lingums seem to be held in any degree of reverence. When we pause to weigh in our minds what this signifies we can have but little respect for either temples or people. To go through them is to have our senses of both sight and smell outraged. The nightmare images of their gods are daily daubed with vermillin and castor oil. The castor oil

lamps and tallow candles reek to heaven with vile effluvia. Even our ears must endure the torture of discordant drums beaten out of time to the sounds of discordant horns and jangling bells that are intended to drive out the devils that we poor foreigners are supposed to bring along with us. Priests bring threaded jessamine and rosemary necklaces, place them over our necks, offer a prayer for our prosperity, and then turn around and demand pay for services we did not request.

UNCLEAN CUSTOMS OF THE HINDOO.

As we turned away from the temples and went into the streets again we were met with Hindoo uncleanliness. Foods of many kinds are displayed for sale not only in, but actually on the streets. All kinds of grains, peas, beans, potatoes, fruits, sweetmeats and bread are laid down on dirty thin mats upon the street and there offered for sale. Frequently not even a mat lies between the dirt and the food. It is no uncommon thing for cows to come along and spatter such food with their droppings. The walls of the houses are stuck all over with animal manure that has been picked from the street, patted with the hands into cakes and then placed there to dry. In every quarter of these native cities this sort of disfigurement is conspicuous and everywhere can be seen women and children collecting, moulding, and drying dung. It seems to form a large part of the fuel used and the dried cakes are offered for sale as coal or wood are in this country. The germ-laden dust from this traffic must be ubiquitous and when added to the deposit of flies it does seem as if no article of food can be free from pathogenic contamination. Where goat meat, clotted milk, sweetened rice, and other such oriental delicacies, are exposed for sale immediately under the feet of passing purchasers and where sacred animals have preferential right of way over such foodstuffs, one cannot hope for hygienic conditions. But the funny part of this tragic state of affairs is the way that these people look upon us. Because we acknowl-

edge ourselves casteless, and because we are willing to sympathize with and try to elevate their no caste pariahs, they actually consider us common and unclean. We are no better in their eyes than are the down-trodden and despised men and women who clean their streets and do their unnamable work. If we touch an article designed for use in the handling or conveyance to their mouths of food or drink it becomes, from that moment, utterly defiled. To enter a mart where such articles are offered for sale is to create immediate consternation on the part of the merchant. He watches every move and every act with unfeigned fear for whatever we touch must be destroyed and never again offered for sale. In none of their homes could an American or European get a drink of water or a morsel of food unless every handled vessel was paid for and even then, some of the extremely orthodox would not consent nor permit admission to their home. Christian missions have to provide special chapels for no-caste natives to worship in as the feeling is so strong against them that the lowest caste men, even after becoming liberal in faith, will not be seen associating with them. It is not generally known in America that every Hindoo who visits our country, or any Caucasian country, by that very act forfeits his caste and becomes a despised renegade. The railways are doing more to liberalize them and break down these senseless barriers than all other agencies put togeher. In making pilgrimages to their sacred rivers and sacred cities the most devout are forced into contact with low caste and sometimes no-caste people, so that by perceptible degrees concessions have to be made and compromises with conscience accomplished.

The poor pariahs have a horrible condition of life to endure. They are cuffed, kicked and whipped unmercifully for the simplest infractions of supposed duty. To dare to retaliate would mean a public scourging, or even death. At Tanjore I saw one maltreated in this way by a railway official. When his tormentor had gone I gave him, as a soothing balm, a four

anna piece. This is worth in our money eight cents, but was the equivalent of a couple days of earnings to the poor fellow. He first looked at the money in astonishment, then he took a look at me to see if I really intended that he should have it, and on making up his mind that it was intended for him, tears welled up into his eyes. Before I knew what he was about he was down on his knees before me kissing the ends of my shoes. Until my train came to bear me away he watched me like a faithful dog, anticipated my every move, and did everything he dared to do to make things comfortable for me.

In Tanjore is "Sri Besant Lodge," the miserable little headquarters of the Theosophists. Madame Blavatski's efforts, coupled with those of her English and American supporters, have but little to show for thirty years of miracles and difficult propoganda.

At Trichonapoly, after giving due attention to the temple of Sri Rangam and the Hall of 1000 Pillars, we paid a visit to the tank in which Bishop Reginald Heber was so unfortunate as to lose his life. Bishop Heber is well known to every American as the author of that most popular of Sunday school hymns, "From Greenland's Icy Mountains." Students of history do not need to be reminded of the fact that the country around Trichonapoly figured largely in establishing the conditions that led to the birth of the United States. In England's wars with France she exhausted her revenue, and driven to the verge of desperation from lack of ready cash, she passed the obnoxious stamp tax which brought down the anethemas of the American colonists. One of the largest of the sink-holes into which British gold had then been poured was here in the Deccan. France was driven out of India. Clive triumphed over Lally at about the time that Otis made the inflammatory speech in this country against King George. The humiliation which this brought upon France was the chief cause of the strong sentiment it gave the French in our favor that led to

the secret sending of money and other help to America. The thoroughness of the subjugation of France inflated the feelings of the dominant party in England to such a degree that they would listen to no words of conciliation regarding the "rebel" sentiment of the "colonists." Tom Gage's proclamation lit up the then half smothered conflagration and the Declaration of Independence came as a logical consequence. England by winning the Empire of India lost her far more valuable assets in America.

THE BUBONIC PLAGUE AT BOMBAY.

After a brief stay in Madras my itinerary led me to Poona, the recent hot-bed of bubonic plague. A few weeks preceding our

St. George's Hospital, Bombay.

arrival at Poona nearly two-thirds of the inhabitants had fled from the danger and taken up their abodes in more wholesome regions. We found the Connaught Hotel almost guestless, the Sisters at the Sassoon Hospital looked as if they had been overworked, the streets lacked the life and animation which we expected to see, and everybody was talking about a hoped-for revival of business now that the people were beginning to come back.

On reaching Bombay we found that there was still a good deal of talk about the plague there, but no one appeared to manifest any fear of it. In every part of the city we saw men carrying rat-traps which the Board of

Health was supplying to the public as one of the means of arresting the disease. It is believed that the rats are the chief, if not the only carriers and that their destruction will be the destruction of the malady. As a prophylactic Haffkine's serum was being extensively used. Bombay is, in every sense of the word, an up-to-date city. Nowhere are there finer buildings or more beautiful ones. The railway station is a marvellously handsome building. The post-office, court house, city hall, and other public edifices are palatial in their magnificence. The Taj

Plague Hospital.

Mahal Hotel cannot be excelled anywhere. Even such market places as the Crawford Market are not to be despised as works of art. A general view of the city, from Malabar Hill shows the visitor that even in its lay out, it is quite a pretty place. It is well supplied with excellently equipped institutions of learning. The Grant Medical College will compare favorably with anything in our own country. Adjoining it is the fine, large, Jamsetjee Jeejeebhoy Hospital with accommodation for 500 patients, the Hospital for Incurables, the Dinshaw Maneckjee Petit Hospital for women and children, and the Bai Motlabai Obstetric Hospital. Besides these the city contains the Gokaldas Tejpal Hospital with accommodation for 150 patients, the Pestonji Kama Hosptial with 75 beds for women and children, the Allbless Obstetric Hospital, and last, though not least, St. George's Hospi-

tal. The presence of the plague in the city has brought into unusual prominence the Plague Hopital. It can accommodate from 300 to 400 patients. It is composed of a number of one-story buildings to which patients are carried in a two-wheeled cart drawn by a couple of coolies. The stretcher is laid on the bottom of the cart, and on it the patient lies till he is ready to be transferred to the hospital cot. The cart is painted white and has a white awning over it while a blanket constitutes the covering of the patient. In most of the hospitals the Parsees have a special part allotted to them. Their sick have so many visitors that it has been found necessary to adopt this measure so as to save other patients from the annoyance.

THE PARSEES.

The Parsees are the chief moneyed men of Bombay, so that their influence is very great. As they are exceedingly philanthropic and in every way public spirited and liberal they are well liked by most of the people. Their peculiar way of disposing of their dead is an object of great curiosity to tourists. The five "Towers of Silence" on Malabar Hill is one of the chief sights that they all wish to see. While it is very questionable as to whether this mode of disposing of the dead is one that is quite safe for the public no one in Bombay would think of whispering such a fact for fear of giving offense. The nude bodies of the departed are exposed on the top of these towers to the ravages of vultures. So thick are these birds around the towers that in about half an hour after exposure the bones are stripped clean of flesh. These bones are left to bleach and dry in the sun after which they are dropped down into the tower well where they are permitted to decay and where the rain washes the decayed matter through charcoal into the ground, from whence it finds its way into the sea. Antiseptic precautions are taken at every step of the proceedings except as regards the vultures. There is no way of guarding against their scattering contagion

wherever they happen to go. Even when flying over people's heads they are dropping infection.

THE PLAGUE AND ITS CAUSES.

A careful study of the evidence in our possession shows us that plague is most likely an intestinal disease. In every experiment yet made the only avenue of escape for the germs that has been found is from the intestines. It is quite true that the blood is invaded in this disease just as in malaria, but this is found to be equally true in typhoid fever. While inoculation may account

Inoculation Against Plague.

for some cases this is rendered unlikely by the fact that its cause is a bacillus and not a protozoa. It is much more nearly related to typhoid fever than it is to malaria, yellow fever or smallpox. The fact of its possessing a pneumonic form is, in the light of Calmette's recent experiments, rather confirmatory of its intestinal character. Calmette has shown that pneumonia and tuberculosis are imparted to animals by way of the alimentary canal, and it is a well-known fact that typhoid fever has a pneumonic form. As in typhoid and other intestinal infections, ambulatory forms are quite common, and in the discharges of these the bacillus of Kitasato and Yersin are found. General distribution of the bacilli through the system

would give the septisemic form while invasion of the glands give the bubonic form.

The one most important fact that for some reason medical authorities seem inclined to minimize, is that in every epidemic the first victims are usually keepers of grain stores, bakers, grocers, keepers of delicatessan stores and dealers in foodstuffs of various kinds. It is quite likely that rodents carry it to foodstuffs when foraging for something to eat. Their connection with the plague has long been recognized and in the description of the battle of Ebenezer, between the Israelites and the Philistines, the book of I Samuel gives us a graphic picture of an epidemic of plague in which mice figured conspicuously. Yersin has fed rats and mice with infected flesh and they have died with the disease. Their dead bodies showed the characteristic leisons and were swarming with the bacilli. Every locality in which plague flourishes has been reported as conspicuously filthy. What does this mean except that food, in some form, is left around where it should not be for the germs to feed upon? Decaying animal and vegetable matter, fecal matter, and the like are, chemically considered, neither more nor less than rejected food. No filth disease can flourish except upon food and pathogenic germs are not known to be particularly careful as regard the kind of food they will grow upon so long as it contains a supply of protein and carbohydrates. They are quite willing to grow upon the food we have in our kitchens and they are equally willing to grow on that type of food we characterize as filth. As long as they remain in the filth food we are quite safe from them. It is when they get out of that by the aid of flies, wind, dirty hands, etc., that they become dangerous. Being conveyed to otherwise clean food they multiply in it, we swallow them, and then they do the rest.

Water that contains, in solution, enough food to permit of their multiplication is dangerous, but if ordinary drinking water was half as dangerous as we have been taught, the world would have been depopulated millieni-

ums ago. The habits of the people of India, as herein described, are ample explanation for the persistence of plague among them. If they were not highly immune to it they would no doubt suffer far more than they do. The water they drink is infinitely more likely to be laden with millions of disease germ than ours is. Their food is far more subject to infection than ours. Bad as their water happens to be I am quite satisfied that even it is not bad enough to directly give them any disease. When used for culinary purposes and when employed as a cleansing agent for vessels that are to contain food, it sows the seeds that multiply in the food, to the poisoning point and in this way imparts disease. In the case of plague, inoculations may occur by bugs or fleas, as surmised, but it does not appear from the facts that this cuts any great figure in an epidemic.

Professsor Bruno Galli-Valerio, of the University of Lausanne, very clearly showed how exceedingly slight the evidence was on which Dr. Simond made his guess about the part taken by fleas. On that guess ingenuous speculations have been built that are as yet rather unsatisfactory. Dr. Nuttall, of the University of Cambridge, reports having made over 250 experiments with fleas and bugs as carriers of plague, and every experiment was a failure. In no instance was he able to get a flea or bug to impart the bacilli of plague to rats or mice. The germs were always digested in the alimenary canal of the insects. Kolle repeated the experiments of Nuttall and got the same negative results. At the Plague Hospital, in Bombay, they are inclined to favor this theory, simply because they have been baffled in trying to conceive of how the germs get from the rats to the sufferers. They are apparently unwilling to give the food theory the slightest attention. They act as if they did not want it to be true and are letting sentiment overcome judgment, a not uncommon thing for weak mortals to be guilty of.

Just now the plague is knocking at our own western door and we cannot tell how

soon conditions may arise that will favor its spread. Never before has plague spread so far in this world, but happily its virulence is but slight and its victims comparatively few. Experiments show that there are conditions of food, of moisture, and of temperature that alter its virulence, and control its powers of multiplication. When these are favorable it become exceedingly dangerous and multiplies with great rapidity. During the great plague of 1361 its danger was at a maximum. Hecker tells us that 25,000,000 people died in Europe from it. In the great plague at London, in 1665, about 70,000 lives were sacrificed by its ravages.

NORTHERN INDIA.

To the medical man who visits India for the first time professional interest is likely to centre around the endemicity of cholera, plague, malaria, with, possibly, diabetes, this being the centre from which, from time to time, the two first named spread out to become pandemic, and may have been the original source of the last two. To one interested in broad medical generalization no more fascinating topic can be conceived than would be a thorough study of the conditions that contribute toward the perpetuation in this region of these maladies. The character of the country, the habits of the people, the strange religious beliefs, the past and present political conditions, all, no doubt, contribute a share toward making this a focus of constantly menacing danger to the rest of the world. From this center plague has repeatedly gone forth after having died out in other regions. From the valley of the Ganges Asiatic cholera comes and goes as conditions conspire to favor its spread. This region it never leaves, though it may die out in every other part of the earth. In the Himalayan Tarai, and in the low deltas of the rivers of the East coast, malaria, of the most pernicious type, is always found. Within the Tarai over 50 per cent are thus afflicted. But what is worse still the death rate from this one disease mounts up to 50 per 1000 per annum. It was in Northern India that Major Ronald Ross, inspired by the study and theoretical research of Sir Patrick Manson, was enabled to trace the life history of the malarial protozoan by discovering it in the bodies of Anopheles. It was in Ceylon and India that the presence of sugar in the urine of diabetics was first known, and it is among rich Hindoos that this disease seems to be most frequent. If in any way connected with

a pathogenic micro-organism India may have been the country in which it developed its mischievous power.

FACTORS IN THE SPREAD OF DISEASE.

Our route from Bombay to Calcutta led us directly through those parts of the country known to be the worst in all of these diseases. As we proceeded we naturally took note of such conditions as are likely to raise or lower the vital resistance of the people, to aid in the survival of pathogenic micro-organisms, to diffuse or scatter these over this and other countries, and to heighten the virulence. We very early concluded that the conditions that led to famine were the ones that lowered vital resistance most, that religious beliefs led to habits that materially aided in the survival of pathogenic germs, and that pilgrims and pilgrimages are important factors in heightening virulence and spreading disease. A study of caste led me to infer that its restrictive rules may be a survival of hygienic laws once imposed by intelligent Aryans. The ablutions and formalities of cleanliness now practiced look as if they might be remnants of what were at one time more or less clearly conceived prophylactic measures against disease. Some of the high caste priests and modern Arya Samajists entertain, with considerable show of reason, some such idea regarding them. But alas! if this is so, how great the mental degeneracy of the common people. In proceeding from Bombay eastward most tourists make a detour toward the north, in the direction of Delhi, as up there are the chief objects of attraction for visitors. Between Bombay and Delhi lie such interesting points as Surat, Ahmedabad, Mount Abu, Ajmer, Jaipur and Amber. Between Delhi and Calcutta lie Agra, Cawnpore, Lucknow, Benares and Sarnath, all of which every stranger, who can spare the time, is sure to see. In the direction of Nepaul lies Darjeeling, the summer resort of the European residents of Calcutta, and the place where the majority of travelers go who are desirous of seeing the highest mountain peaks in the world.

DENSITY OF POPULATION.

The area of the United States, including Alaska, is 3,602,990 square miles. That of India is 1,766,797 square miles. In our country there are about 80,000,000 people while in India, with about half our area there were 294,360,356 people, when the 1901 census was taken. The density of population is greater than that of Europe while the available farming land is less. The country, from time immemorial has been subject to periodical droughts, yet until England took control no forethought was shown by people or rulers to try to avert such catastrophes. At every such drought famine is inevitable and hundreds of thousands suffer or perish.

THE GREAT CANALS.

Among the most interesting sights that the intelligent tourists see in crossing through the regions mentioned, as well as through the Punjab in the direction of Lahore, are the irrigating canals. Over thousands of miles these valuable engineering works can be seen. They, and the railways on which the tourists travel, are evidences of what England is doing for India. The barren area in the Punjab alone, that has been redeemed, contains 35,000,000 acres. The Chenab Canal supports a population of 532,000 where no one could live before. In this way not only are regions subject to periodical famine saved but new regions are opened up for surplus population. The railway, too, can now take help to regions visited by famine as could not be done before. In the famine of 1900 Great Britain carried, in this way, relief to 6,500,000 people who, under the old rule, would have perished. Through all past time a million or more dying from famine at each periodical appearance of the same was looked at as the normal condition and was viewed with callous indifference. When multitudes seek to keep soul and body together by devouring filth laden with disease germs, what can be expected as regards the hygiene of such a country?

A COUNTRY OF DIVERSIFIED TONGUES.

We are likely, at the great distance the United States are from India, to look upon the latter as a homogenous country, occupied by a single race of people. No greater mistake could be made. The people of India are as diverse in language, habits, religion, and character as is Europe. Indeed there are more distinct races. Their speech is as unintelligible to one another as is that of a Frenchman to a Slav, or of an Englishman to a Russian. But for this the English could never have been in control. But for this 7,600 British troops could not hold in subjection nearly 295,000,000 of alien people. When the Indian mutiny occurred, in 1857, Britain had only 40,000 home soldiers in the whole country. One year later, when the mutiny was practically subdued, there were only 100,000 there. Should Britain vacate India the Mohammedan masters of the Hindoos would at once take control and repeat the atrocious rule from which England was forced to save them, in order to save English property that both parties to each of many quarrels were destroying and attempting to confiscate. What did the Moguls ever do for India or the Hindoos? What did the Brahmins ever do for the original natives? What we saw during our tour will partly tell. England now permits a number of the native princes still to rule over their respective peoples, interfering with them no more than we interfere with Cuba. She maintains a resident at each court to see that no treason is fomented or measures leading to public injury adopted. She has stopped the murdering of innocent people by the Thugs, the burning of widows on the pyres of their husbands, and the immolation of self-sacrificing saints before the cars of Juggernaut. She has sought to make clean an exceedingly filthy people, by practical sanitation, and has restricted the spread of epidemics by a reasonable quarantine. She has spent every rupee collected, as taxes, on India and on the Hindoos, except so much as was necessary to maintain her supremacy there by the use

of proper officers and soldiers. Even in this she has favored natives by putting them into political positions and converting many of them into policemen and soldiers.

COUNTESS DUFFERIN AND HER WORK.

Under Mohammedan rule women were uncared for, particularly during sickness. Now they bless the memory of the Countess of Dufferin, and bless the day that England chose Lord Dufferin as Governor-General. She was their good Samaritan who established a fund that supplies them with female physicians, female nurses and midwives. Their religion kept them from employing male doctors so that they had to go uncared for till this good angel came among them. That her Ladyship has a warm place in her heart toward Americans was shown by her kindness toward the writer, who visited her at her home near Bangor, Ireland, before going on to the Orient. Though myself and wife were strangers to her she personally showed us over her beautiful home, because we were Americans. The lodge-keeper informed us that she is always pleased to meet people from America.

REMNANTS OF OLDEN GLORY.

The contrast between England's way of treating the Hindoos and that of the Moguls is emphatically on exhibition at Delhi and at Agra. Unfortunately few visitors to these places stop to draw the true lesson from the magnificent remnants of their former splendor. Dazzled by the vestiges of the now fading glory only words of praise are ever uttered. Though the Dian-i-'Am no longer contains the peacock throne, nor the Dian-i-Kas its solid silver ceiling, enough is still left to emphasize the significance of the Persian inscription at both ends of the latter hall:

> "If heaven can be on the face of the earth.
> It is this, oh! it is this, oh! it is this."

Three months before I stood in the Hall of the Embassadors, and walked through the Court of Lions, of the Alhambra, at Granada, Spain. There, like Washington Irving, I

had enthused over the beauty of that finest remnant of Moorish art. But what was that stucco work when compared with Delhi? How insignificant it appeared in contrast with the Taj Mahal? The pressed plaster looked truly beautiful, but solid marble and alabaster carved in far more delicate tracery has a witchery for the senses that the Alhambra never could produce. Nor had the latter any of the exquisite mosaics that adorn the walls of Delhi and Agra's palaces and tombs. Once the flowery tracings of floors and walls were genuine rubies, diamonds, sapphires, pearls, and other costly gems. The great throne had its canopy of gold, its massive feet and body of solid gold, the expanded tails of its two peacocks had every feather colored, as in nature, but with precious gems, the life-sized parrot cut out of a solid emerald, and the royal crimson velvet umbrellas that stood on each side were embroidered and fringed with pearls, the handles being eight feet long of solid gold encrusted with large diamonds. It is estimated that when Nadir Shah, the Persian, ravaged Delhi he carried off precious gems to the value of $350,000,000 in gold. Among the things he took was the celebrated Koh-i-nor diamond, at that time the largest in the world. Nero is said to have fiddled while Rome burned, but the Great Moguls had their amusement in deserting whole cities of palaces at the slightest whim and rebuilding more gorgeous ones a short distance away from the first. They left the old palaces intact as homes for bats and owls. Even their tombs cost immense fortunes. There are multitudes of them any one of which would be famous were they not outrivalled by the peerless Taj. This is in Agra and strange to say, is the monument built by a Mohammedan over the remains of one of his wives. One of the Seven Wonders of the ancient world was a monument built by a queen over her sovereign husband. It is safe to assume that that wonder did not approach the splendor and indescribable beauty of the Taj Mahal. No other building in all the earth impresses an

observer so sweetly or looks as a whole so lovely. This is the verdict of every one who has ever seen and written about it. It is said to have cost $100,000,000. The carved interior is a wonder of decorative art.

But, from whence came all this money and labor so lavishly displayed everywhere, around the region being described? These Mohammedans surely did not bring it from Arabia? It was all taken in the form of taxes, from their subject, Hindoos. While England collects far less per head from this same people she returns it all to them again. She opens up new farms in deserts for them, she supplies them with water when the rains fail and thus saves them from famine, and she feeds them when famines come to regions that her improvements have not yet reached. In this the two masters differ.

Let England retire from India and no sane person, who has squarely looked the facts in the face, can doubt that the Moslems would again repeat history, by re-establishing the very conditions that made pestilence stalk through the earth.

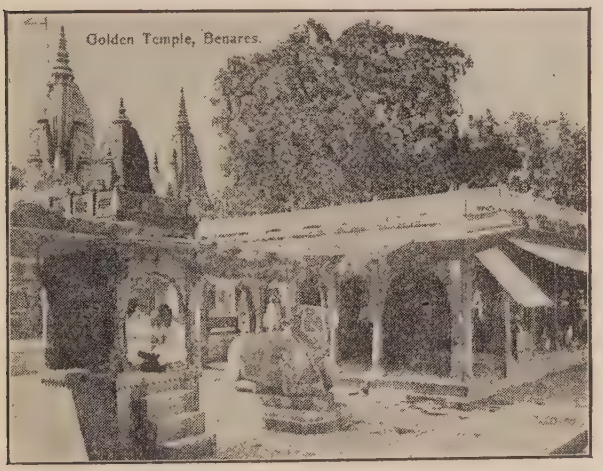
THE HINDOO IN HIS HOME.

At Benares the tourist has a good opportunity of studying the Hindoo in his own sacred city and seeing what he is as a whole. There are few, if any Swami Vivi Kenandi's there. This gentleman was my ideal of a true Hindoo until I visited India and was disillusioned. His philosophy sounded very fine to the thousands of Americans that heard him at the World's Congress, in Chicago, and elsewhere through our country. Alas, that philosophy is not the philosophy of Hindostan. Mark Twain, in his "Following the Equator," has much more nearly represented it as I found it. Like many another reader of Twain, the Twain description appealed to me as very funny, but on reaching Benares and seeing it for myself, the fun disappeared. It was solemn truth that he had written. He but states the fact when he says: "With us the poor spend money on their religion, but they keep back some to

live on. Apparently, in India, the poor bankrupt themselves daily for their religion."

THE SACRED GANGES.

Not only do they spend it on priests and on temples, but some of them renounce everything in life to get to Benares in order to drink and wash in its per-filthy water. In an early morning sail on the Ganges we saw thousands of these deluded people wash their dirty bodies and dirty clothes in the muddy current. We then saw them lift it to



Golden Temple, Benares.

their lips in double handfuls and drink it again and again. Just above them on the stream we saw the calcined bones and ashes of a corpse poured out into the very water they were drinking. All around the drinkers were hundreds washing out their mouths and near them were other hundreds washing dirty feet. The reason for all this is truly told by Twain when he says: "Those people were not drinking that fearful stuff to assuage thirst, but in order to purify their souls and the interior of their bodies." A little farther down and a sewer poured the pollution of the city into the same stream yet there

were still other hundreds drinking that water. Twain must have seen a similar sight for he adds: "The sewer water was not an offense to them, the corpse did not revolt them; the sacred water had touched both, and both were now snow-pure, and could defile no one." On a number of occasions we saw pilgrims that had been to Benares on their way home with the holy water from that stream. Over the shoulders was a yoke on which hung baskets loaded with bottles filled with it. In one case we were over 200 miles from the Ganges and there were five men trudging along each with this kind of a load. They dared not rest their burden on the ground, but must find an elevated post or wall on which to put it. The British had taken pity on such people and fixed resting places for them by the way. In other places we saw old men on the way to Benares tied around the waist with ropes that younger men held fast to as if to urge them along. The old men had long bamboo walking sticks and the young men carried bags with food that was begged along the road. They were going to get that water—a water that has not, for ages, been free from the germs of Asiatic cholera. On their return home, after such a pilgrimage, they are deemed very holy men and the water that they bring back is eagerly sought for. In a trip we took into the country, when at Benares, we found multitudes of pilgrims coming and going to the sacred city. Whole families were passed in which wives and babies, chickens and lambs, beds and bedding were nestling together within panniers strapped to the side of a docile donkey, while the husband trudged along with his bamboo cane. The chickens and lambs were offerings for the priests. In one instance there were five children in a single pannier while the mother rested with the bedding and offerings on the opposite side of the ass. Few of them could have passed muster before an American policeman, so far as their clothing was concerned, yet they had offerings for the priests. Generally they had little more than what

looked like a worn-out table cloth around their loins. A number of those clothed in cotton garments had deliberately taken carmine aniline dye and thrown it over themselves, so that they were sprinkled as with blood. Their clothes were streaked and daubed, in the most promiscuous manner, with what was practically red ink. We spent a day visiting the Benares temples. The Golden Temple together with its surrounding subsiduary temples, were loathsome with filth and the odor of oil. As we entered, a big fat priest insisted on supplanting our guide, Ram Pershad, in order to exact an additional fee from us. When we got in it was for all the world like the interior of an exceedingly dirty cowshed. Sacred cows jostled us at every turn. All over the floors were the diarrheal droppings of these cows. Rows of male and female beggars stood by every entrance. They were all saalaming and praying the white "Sahib" to give them "baksheesh." We passed at least 300 of them. On parting with the priest I handed him a rupee and received his maledictions because I refused to give him three times that sum. He wanted a rupee for each of us, guide included. He was of no earthly use to us so that he was merely endured in order not to make things unpleasant.

The Monkey Temple was hardly as dirty as the Golden Temple, but a more mischievous lot of monkeys I never saw. They roam at large and every visitor is expected to feed them, so that they are kept in good condition. They come up to the visitors and steal from them the nuts and fruit that is brought in for distribution. One imp stole from me a bag of nuts that was intended for the entire lot. He came up behind me and snatched it out of my hand.

THE PILGRIMS AND THEIR TRIBUTE.

At the Sahki Vinayak Temple, or temple of the witnessing deity, crowds of pilgrims stood around awaiting their turns to get certificates from the officiating priests, attesting to the fact that they had paid their devotions

to the proper number of temples, been often enough in the holy river, and said prayers enough to win the right to return home as sainted individuals. The rounds these poor dupes had to go and the number of fees they had to pay must have amounted to a considerable sum since there are in Benares over 2,000 temples. These are presided over by 30,000 priests. The priest to whom I paid the rupee sneeringly asked me how far I thought that would go when divided up among the 400 priests of the one institution

Hindoo Cremation.

over which he conducted us. They are always on the lookout for money. But for them, under present rule, the people would be well and prosperous. Slowly the English and American missionaries are establishing schools among them that are sure in time to emancipate enough of them from superstition, to break this yoke. Their religion is not at all like what we call religion. It is true that the Brahmin priests have a religion for themselves that approaches ours, but to the people as a mass religion is only a means of securing good luck in this life and the next. Their prayers are not offered to Brahm, their supreme God, but to Siva, Vishnu, and

other deities that they seek to propitiate for fear of their bringing bad luck to them. The one all-pervading doctrine of India is that of re-incarnation. If a man sins he will be born blind, or lame, or a leper, or a man without caste, or a dog, or a snake, or a pig, at his next incarnation. If he is very sinful he will suffer in Patala before being re-incarnated. In this abode of eternal night the only sounds heard are the screams of sufferers from the crushings, cuttings and burnings they must endure. Every sense and every member of the body has a special suffering to endure. In order to avoid such tortures they pray, go on pilgrimages, give their last cent to priests or pilgrim, and expose themselves to famine and disease. There are degrees in this degeneracy of ignorance and superstition. While some pollute themselves by overwashing in filthy water, there are tribe castes that never wash a single garment that they wear. Should one of them merely dip an article of apparel in water he would be ignominously expelled from his tribe. These, however, make no pilgrimages to Benares.

DARJEELING AND THE AMERICANS.

While the Brahmanic pilgrims scatter disease all over India it is the Buddhist and Mohammedan pilgrims that take it from India to other parts of the earth. There are about 63,000,000 of Mohammedans in India and every one of these has a longing desire to, some time during his life, go to Mecca. During times of great sickness this desire is at its maximum. When he sees multitudes dying around him he then wants that consolation of his religion that can only be obtained at Mecca. He carries the germ of disease there and when packed in the holy mosque, with other pilgrims from many parts of the earth, it is no wonder that this should so frequently prove the radiating point of fierce epidemics. At Sarnath, near Benares, is the birth-place of Gautama Buddha and to this place come Chinese, Japanese, Siamese, Burmese, and others as pilgrims. This tends

to carry from the same Ganges center the germs of plague and cholera in the opposite direction from that of Mecca. It thus happens that a large part of the earth is sown with fresh germs of diseases that would otherwise die out. The commerce of Europe and America overlaps the paths of these pilgrims so that no part of the earth can escape infection. At one time the Buddhists were the largest body in India, but for some reason as their strength increased abroad it waned in India. While they are strong in Ceylon there are scarcely any of them around Benares. At Darjeeling there are many and up there, in sight of the eternal snows of the Himilayas, their prayer wheels and prayer flags are constantly in evidence. It is a common thing to meet a ragged, dirty, lama carrying his prayer wheel and chanting, as he causes it to twirl around, "Om Mani Padmi Om." Over and over again he reiterates these words in a dreary sing song tone while the boy that accompanies him is begging alms. In the temples are many of these wheels, and devout Buddhists run large ones by water power so as to be able to "pray without ceasing." When one of these people dies two new prayer poles are erected with fluttering prayers on flags that the winds may bring his soul from purgatory. The natives around Darjeeling are more like Chinese than Hindoos. Some of them, however, have such large flat noses that they look very comical. Most of the men dye their beards and so remarkable are the colors that the effect is startling. In Rajputana we had become quite accustomed to the almost carmine beards of the Mohammedans. One of these men seen at Ajmere was at least seven feet high, and well proportioned, but his beard gave him a most ferocious look, with its black roots of new growth and its carmine—not hair—red ends. In Darjeeling there are brick colored beards, carmine beards, purple beards, and greenish-brown beards. The natives are small, but the loads their women carry up those mountains are astonishing. All the porter work is

done by women. They all smoke and the smallest children seen in the streets are ever puffing cigarettes. Most of the sickness of Darjeeling comes from the Tarai or from the plains below. It is the summer resort and health resort for the people of Calcutta. They have a very fine sanitarium and the hotels are good. American tourists were there in abundance during my visit and it was a source of great amusement to me to see them all refraining from drinking pure Himilaya Mountain water, because their family doctors had told them, before leaving home, that they must, while in India, only drink bottled water if they would avoid catching plague or cholera. They were paying the landlord of the hotel exorbitant prices for bottled carbonated water to drink while he offered them, free of cost, what was probably one of the purest and best drinking waters on the earth. On examining the labels on the bottles of the carbonated beverage I was more than astonished at discovering that it was put up at Benares. Of course it was guaranted as perfectly pure and exceedingly wholesome. To the Hindoo mind there is no water so pure or so wholesome as the sewer and corpse-contaminated product of the Ganges. It may have been a perfectly pure water but, to say the least, any water coming from Benares could not be above suspicion. The circumstance set me to moralizing and wondering whether, after all, conditions, rather than mental superiority, was not at the bottom of the differences between the average men and women all over the earth. The Hindoo pilgrims accept, with unquestioning faith, the prescriptions of their priests for their soul's supposed requirements. These American pilgrims were doing the same by the prescription they had received as a prophylactic against bodily ills. Neither used a particle of judgment in connection with their prescriptions. The literal obedience was as superstitious in one instance as in the other.

CALCUTTA, THE INDIAN CAPITAL.

Our last stopping place in India was at Calcutta, the capital of the country. It has a population of nearly one million and is well supplied with colleges, hospitals, and museums, as well as churches, mosques, and temples. In its Royal Botanic Gardens stands what is probably the finest banyan tree (Ficus indica) in the world. It covers ground that is but a trifle short of 1,000 feet in circumference. Its 250 aerial roots make it the wonder of the vegetable kingdom. Milton, in Paradise Lost, says of it:

> "The bended twigs take root, and daughters grow
> About the mother tree, a pillared shade,
> High over-arched and echoing walks between."

The principal hospitals of Calcutta are the Medical College Hospital, the Ezra Hospital, the Dufferin Hospital, the Campbell Hospital, the General Hospital, the Mayo Hospital, the Eden Hospital, and the Military Hospital. If one might judge from what Mr. Rudyard Kipling has said about this city it ought to need these and many more. In his "Tale of Two Cities" he refers to Calcutta in the following rather uncomplimentary terms:

> "Where the cholera, the cyclone, and the crow come and go;
> Stands a city—Charnock chose it—packed away near a bay.
> By the sewage rendered fetid, by the sewer made impure,
> By the Sunderbunds unwholesome, by the swamp moist and damp."

In "From Sea to Sea" the same author has this to say about it: "For diffused, soul-sickening expansiveness, the reek of Calcutta beats both Benares and Peshawar. Bombay cloaks her stenches with a veneer of asafoetida and tobacco; Calcutta is above pretence. There is no tracing back the Calcutta plague to any one source. It is faint, it is sickly, and it is indescribable. It is certainly not an Indian smell. It resembles the essence of corruption that has rotted for the second time—the clammy odor of blue slime. And there is no escape from it." Conditions there must have been very bad when Kipling visited it for my experience of Charnock's choice though less agreeable than was that of

Bombay was far from unpleasant. My olfactories are usually pretty good, but I cannot say that I was able to discover any such state of affairs, and yet I went there expecting it. Calcutta has neither the beauty of situation nor architecture that both Madras and Bombay can boast of. The washings of Benares, by the time they get to Calcutta, must be pretty thoroughly oxidized, and therefore disinfected. A little more public spirit, on the part of its citizens, could soon make it as fine a city as Bombay. It already has several quite pretty buildings and promises soon to have more. As it is the capital, and the

General Hospital, Calcutta.

winter home of the Viceroy, the barbaric instincts of the submerged millions might like to see it imitate the pomp and splendor of the Delhi of the Moguls. It is to this instinct that we are indebted for the highly bizarre durbars. With the developments of time such an instinct is likely to be effaced and the average man of the future will commend the economy of Caclutta unless it should sink to penuriousness. Until India has been cleaned of plague and cholera; until its Tarai has been freed of mosquitoes, and until the last death from famine has been recorded within its borders, it will always seem to men of sane judgment that the

Government is acting wisely and well in not spending immense sums in the creating of splendid public buildings or regal palaces. When Mr. Job Charnock chose the small village of Kalikata, as a good place to settle as a merchant, he had no idea that he was fixing a site for the future capital of India. For the Government to now attempt to move it would mean the adoption of such tyranny as that pursued by Shah Jehan when, in 1638, he abandoned old Delhi for his Shahjehanabad. Such summary measures would be intolerable now. But the Mohammedan Moguls were not alone in this forcible removal of city sites. In 1728 the Maharajah Siwai Jai Singh had all the people of Amber move down to what is now the city of Jaipur. Most Americans, who like myself visit Jaipur, owe a debt of gratitude to the present Maharaja for his uniform kindness to tourists. He permits them to see his beautiful gardens, his well filled stables and his interesting palace, besides supplying them with Elephants to visit the beautiful spot which his grand parents deserted—the old city of Amber. It is not therefore with any spirit of ill-will that I cannot commend either the change or the method by which it was accomplished. The new city of Jaipur is highly to be commended in that it is the only city built by natives that attempts being sanitary and clean. No other native city has such fine wide streets and but few European or American cities can claim equality in this feature . It is the only native city that is properly illuminated with gas at night. Unfortunately its citizens seem to be held by the firm grip of autocratic power. They must build their houses according to a prescribed pattern and paint them all in the same monotonous red, with light blue stripes. The streets all look alike in both form and color. They look, for the world, like the canvas scenes of an itinerant theatrical company and the onlooker is constantly expecting the scene shifter to come along and prepare for a new act. When he suddenly comes in sight of that fantastic nightmare of queer architecture,

the Hall of The Winds, he feels as if the shifting had truly occurred. For eccentricity of design it probably stands unrivalled on earth. The method of rule pursued by the forebears of the present Maharajah may suit the Hindoos better than the milder rule that England now supervises and they may prefer Mogul tyranny to the present beneficient control, but, if they do, they are to be pitied. In matters of religion they are now left entirely to their own desires. The Mohammedans forced them to abandon Hindooism and become followers of the prophet. Millions of the descendants of those so forced now adhere to that faith, from the power of education. Whatever may be the religion of a Hindoo he is zealous, to a fault, in its support. He is willing to go hungry at any time in order to propitiate his priest and his God. The money spent in this way is something appalling, but as it is given voluntarily no one has a right to interfere other than by persuasion. The poverty of the Hindoos, as a people, is almost entirely due to this cause. So small a sect as the Jains have a number of temples that cost, in that country, where labor is so cheap, many millions of dollars. One of these I had the pleasure of visiting that is reported as having cost $90,000,000. It is the Dilwarra Temple, on the top of Mount Abu. It is seventeen miles from the railway station over a most picturesque piece of country. When seen from the outside the temple is very disappointing. On entering there is never disappintment. Any attempt at describing the beauty of design and the excellency of workmanship would lead the reader to call it exaggeration. Never have I seen marble and alabaster chased and fretted with such delicacy and flawlessness. It is the work of men who should have been jewelers instead of stone cutters. Each panel and pillar is fit for preservation in a glass case. In fact it looks like the finest ivory work that we do preserve under glass, but, of course, it is on an immensely larger scale. But all of this was paid for by the sweat and toil of men de-

voted to religion, and it is quite likely that many of those who contributed toward it lost their lives, in season of famine, as a result of failing to provide for such emergencies; the money that should have been used to save their lives was used by their priests for this sort of display.

THE ISLAND OF JAVA.

MOST periterrestial tourists desire to see Java, but the loss of time incurred in making the detour from Singapore, cuts off more than 90 per cent from enjoying this pleasure. Among the chief attractions of the journey may be mentioned the sail on calm seas amid thousands of beautiful islands; the grandeur of the southern sky dotted all over with new and brilliant stars; the trip across the equator; the opportunity of visiting the finest botanic garden in the world; the chance of seeing the largest extinct crater in the world that contains within itself three immense, active volcanos; the meeting with the only people in the world that constantly speak and listen alternately to two distinct languages; the seeing of a people who treat with unusual respect and deference every person with a white face; the visiting of the finest and best preserved specimens of ancient Hindoo architecture; the experience of observing farmers at work on contiguous plots of ground, ploughing, sowing, reaping, planting, harvesting and mowing, all at one and the same time; visiting the place where Dr. Eugene Dubois found the Missing Link; looking over the region that inspired Wallace to frame his doctrine of Natural Selection; seeing where the first cinchona trees were cultivated and where 85 per cent of the world's quinine is grown and manufactured; wandering over the hills where a large part of the world's tea and coffee are raised; going into the home of the birds of paradise and the place from which a large proportion of our prettiest garden flowers has come; observing one of the most singular experiments of government control that exists on the earth; studying a people whose strange ways and strange

condition of servitude make of them one of the greatest curiosities in the world.

After leaving Calcutta our itinerary carried us to Rangoon, Mandalay, Penang and Singapore. Our trip up the Irriwaddy though very interesting, contained scarcely anything of medical interest. At Singapore all passengers were numbered and ticketed as a substitute for quarantine. This made it a duty to report every day, for ten days, to the Board of health officers, under penalty of fine or imprisonment. If no fever developed we were made free. In this way the City of Singapore sought to protect itself from the plague that was raging in Burma when we left there. On reaching Java we found no inspection, no quarantine, and had no meidcal reporting to do. Our trip to Batavia was a most delightful one. The seas and straits were like rivers. All around us were islands that were verdure clad to the water's edge. Drifting cocoanuts, fruits, branches of trees, palm leaves, and great masses of brown fish-spawn streaked, in fantastic forms, the surface of the opalescent blue water. Only at Capri, in Italy, had we ever before seen such beautiful water.

We passed the equator early in the evening, but Neptune failed to show himself on board. Scarcely had the sun disappeared below the horizon than the stars began to glimmer, and soon the sky was a shimmering mass of stars of all magnitudes. So clear was every part that it thrilled with delight even those passengers that knew nothing about astronomy. On the meridian, immediately to the south hung the Southern Cross. Farther to the west, and in a more northerly position, stood out, in unusual brilliance, a star we had often longed to see Canopus. Just above it was Sirius. Here were in sight the two brightest fixed stars in the whole heavens. Near them were the stars of Orion, the Pleiades and the Hyades. North of us, a most unusual place to one from our zone, was Jupiter. We sought in vain for the Pole Star and by the aid of Merak and Dubhe, the two pointers of the Dipper, we were able to

fix its place on the tip of the horizon. By the aid of the Pole Star, the noon-day sun, and a watch that carried New York time, it had been my pleasure to keep track of our course during our entire tour. For the first time since leaving home the watch used for local time and my watch carrying New York time agreed. We were exactly 180 degrees from New York both East and West. The disappearance of the Pole Star told us that we had passed the equator. We knew then that as soon as we had seen Java and returned again to that spot we would, thenceforward, be on our way homeward.

Java is the one place on the earth where the native population has more than doubled within a century. Its people all live longer than they once did. In the United States the Indians have nearly all perished since the white man came. What is the secret of this difference? Perhaps after we have learned some of the particulars of their ways of living and the ways of living of their Dutch masters we may get some hint as to the cause. The Island of Java is 673 miles long, and from 125 to 50 miles wide. Although its area is a trifle less than that of Alabama its population is almost one-third of the United States. There is, probably, no other island on the planet so densely peopled. Since Africa was circumnavigated by Vasco De Gama, Java has been claimed successively by Portugal, Holland, England, France, England again, and finally Holland. It is now the chief and most important part of what is known as Netherlands India. After the battle of Waterloo Holland was freed from France, and England, having taken Java from the French, restored it to Holland again. Since 1816 the Dutch have held it in subjection, although there are five times as many of the Javanese as there are of Dutch in Holland. Every man, woman and child is registered and the Sultans, or chiefs, are held responsible for public conduct. They must all do a definite amount of work, unless sick or too old, upon the coffee plantations. Every regency has a "resident" who sees that the in-

terests of Holland are properly cared for. These Dutch residents are spoken of as the "elder brothers" of the native princes and it is their duty to advise the "younger brothers" how to manage the affairs of their people. A large part of the real estate of the island is held as government property and leased out by the Netherlands government. From this and other sources of revenue, enough money is raised to pay the high salaried officials and leave an average of over $5,000,000 per year to turn into the exchequer at Amsterdam. The governor-general of Java receives twice as much salary as President Roosevelt and has $60,000 per year thrown in as an entertainment fund.

Travelers' Palms and Protestant Church, Bandoeng.

The natives are discouraged in every way from learning the Dutch language. No Dutchman will pretend to understand a native who undertakes to use Dutch words. Every possible measure is resorted to that will keep the natives in willing subordination and servitude. On the highways they are expected to step aside, with hat in hand, to let the white man pass. In order to maintain this severe discipline of the people the white soldiers have to be restricted in their liberties. The instant that a white soldier is found drunk he is hurried into the calaboose so that he shall not bring disgrace on Holland by making an exhibit of himself before the natives. In his dealings with the women

he is under strict discipline, but the former are so thoroughly under the sway of early Hindoo and later Mohammedan public opinion that lapses from virtue are said to be very rare. As a consequence there is little or no syphilis among them. The early Braminical training, followed by over a millenium of Mohammedan rule, has made them constant users of water for cleansing purposes. As the streams are swift, clear, and generally not very deep their bathing methods cannot lead to the pollution that curses British India.

Both sexes among the Javanese are inveterate tobacco users, but, if a stranger should judge by appearances, the women seem to be the worst. They have a most disgusting habit of going through the streets alternately chewing immense quids of tobacco and then holding the chewed mass up to public exhibition between their lips. Masses of nearly half an ounce can be seen exhibited in this way by nearly every native woman one meets. They are not extra good-looking at best, but the disfigurement of a large black streak of half-chewed tobacco protruding conspicuously from their mouths certainly does not improve their looks. The native women of Burma astonished us by going through the streets smoking cigarettes nine inches long and from one to two inches thick, made of alternate layers of rice paper and tobacco, but this was less of a disfigurement than the semi-masticated tobacco protrusion of the Javanese. These tobacco chewing women usually marry young. It is quite common for them to be wives at eleven years of age and mothers before they are twelve. They are as great workers as the men. Besides attending to household duties which include the weaving as well as the making of all the clothes of the family, they can be seen in the fields in as great numbers as the men and apparently doing the same kinds of work. The marts of the native cities also seem to contain as many women merchants as of men. While, nominally, they are all Mohammedans in the western and central parts of

the island, and therefore, theoretically, polygamists the actual fact is that but few of the men care to take more than one wife. That Mohammedanism is but a veneering can be seen by their incessant reversion to Hindoo superstition. In one breath they will offer a prayer to Allah, while facing toward Mecca, in another they will appeal for help to Vishnu, Kali, or other of the Hindoo gods of their ancient fathers. They have gods for every field and spirits to pray to for all sorts of protection. If anything happens that is a misfortune some god is to blame and must be appeased. Dengen brings gout and rheumatism; Sawau causes their children to have convulsions and by selling their souls to Ki they can become rich. By praying to Solomon they expect to secure high rank and by praying to Jesus they hope to become learned. There is not a duty nor an act of life that has not to be done exactly as their fathers did it. The slightest modification in any such rite or formula would bring the maledictions of the gods upon them or bring them into discredit among their fellows. One of the strangest of their strange ways is their constant use of a dual language. It is no trouble for them to know exactly the social position in which their fellows hold them. They all have a language to use to superiors and with which to flatter their peers. When speaking to an inferior, or one of their own class, they use one language and, when addressing a superior, they use another. It is a common thing to hear two men speaking to each other and neither using the same language. The employer speaks to the employee in the vulgar tongue of the island, but the employee must answer back in the polite language.

Like all tropical people they live largely on rice and fruit. The many kinds of unfamiliar fruit which they sell and eat is a great curiosity to travellers. The mangosteen is deemed queen of them all by Europeans and Americans. When first tasted by a stranger he is quite certain to smack his lips and call for more. Its delicious, rich flavored, sweet,

but mildly tart, white pulp is a delight to be tested by taste as it cannot be described.

The habits of the natives are greatly in contrast with those of other Oriental countries. The largest crowds are as quiet and orderly as people coming from a church in America. They are jammed in to over-full third-class cars without a murmur and under the most provoking circumstances one never hears a cross word from them. In a three weeks tour we did not see a single beggar and were not asked at any time for money that had not been earned. Some of them have acquired the vicious business habits of the Turks and Arabs. They have no

Java Women Making Sarongs.

fixed price for what they wish to sell and are quite willing to accept ten times the value of an article, unless the buyer is prepared to look out for his own interest in the transaction.

In the western part of the island both sexes dress in gay patterns. In the eastern part there is a less display of brilliant hues. This may in part be a matter of economy. There is an abundance of indigo raised, and as a consequence garments dyed of indigo blue are all the style. There is not a great deal of difference between the costumes of the two sexes. Both wear a garment called "sarong" that is usually of silk or cotton, according to the wealth of the wearer.

It is composed of a strip of cloth eight feet long and about four feet wide sewed together at the ends but left open at the top and bottom. These "sarongs" are put on by being drawn over the head, pleated around the waist, extending to the ankles, and fastened by a sash. The upper part of the body is covered with another garment of the same or similar material that extends from the shoulders to the knees for the women, but only to the waist for the men. That worn by the women is known as a "kabaya," and that by the men as a "bajoe." A handkerchief, quite like our bandana, is worn by the men on the head. It is tied into place by four knots, the ends of which are generally visible under a hat that surmounts the whole. In the eastern part of the island nearly all of the men wear a short sword, which is called a "kris" and that remains as a vestige of the independence from Mohammedan domination before their Christian masters arrived. They are all Hindoos in their faith and worship, having preserved the old faith by virtue of their once impregnable mountain fastnesses, while the people of the center and west of the island were subjugated. The regents frequently ape the Europeans in costume. All over this land the common people, we were told, fall on their knees when the regent passes.

Through my introductory letter, from the Department of State at Washington, we had the pleasure of being entertained at the palace of one of the most powerful regents, or native kings. The king's brother accompanied by a dozen courtiers, showed us all over the gardens, the palace, the buildings of state, etc., and treated us to French champagne, cake, and other European delicacies. He could speak some English, which he took great delight in using, and told us of his visiting England, France, Germany and Austria, and of the receptions he had with the monarchs of those countries. He assured us that he wore European clothes then but deemed it best to conform to the customs of his own country when at home. We were

taken to see everything around the palaces and within the palaces that he thought could possibly interest us. He took care not to neglect giving us proofs of the great wealth of himself and brother by calling out the body guards and having us examine the diamond, ruby, and pearl incrusted hilts of their swords. He showed us their many fine horses and the richly decorated carriages and sedan chairs. Some of the carriages were close imitations of those of Napoleon, at Versailles. One room contained carriages that had been in use over two hundred years ago. The armory was filled with cannon, rifles, swords, bayonets, etc., of the past century, but all kept scrupuously clean.

Museum, Weltevreden.

Among the odd things which he took us to see was the royal nursery and its baby princes. Being polygamists there was a liberal supply. We were also taken to see the royal dancing women perform and to get a view of the dwarfs that the Sultan had collected for his own amusement. Before we left our royal escort requested an exchange of cards. His reads: "R. M. Ng. Iosdipoera, Kaliwan, Wadhana, Gadingmataram, Karatan di Soerakarta (Java)."

Our tour of the island took us over its entire length and gave us a good opportunity to see the modes of life in the different parts. The Dutch railways gave us several sur-

prises. It takes three days to go a distance that an American railway would carry us in from fourteen to sixteen hours. The trains never run at night Before the sun sets every wheel along the line comes to rest. Their schedule of time has not changed in years. At Batavia, I bought a time table and concluded I had been victimized when I found that it had been printed three years before. The conductor on our first train assured us, however, that it was all right and that we would find all trains punctual to that time At Soerabaya we thought either our guide was wrong, or that the hotel landlord was determined in detaining us an extra day. There is but one train per day on the main lines. We had hurried to get off in time, but no conveyance came to take us to the station until ten minutes after advertised train time. We caught our train all right and found that it was on time, Batavia time, but not that of Soerabaya.

The reason that no cars run at night is because of the danger from earthquakes that are very common in Java. It is a highly volcanic region, numerous active volcanoes dotting the island in every direction. None of the houses can be built of more than one or two stories in height, because of the numerous shakings that they are subjected to. There are no fine modern hospitals or public buildings to show the strangers on this account. The most remarkable of all the buildings upon the island is the Buddist Temple of Boro-Boedoer. It has stood the shakings of very many centuries and is still in good condition, but it has no open interior. It is solid within, all the worshippers having assembled on the terraces without. From its summit is one of the prettiest views on earth, the riot of tropical verdure, adding a wealth of splendor to an otherwise lovely landscape that cannot be elsewhere duplicated. This temple represents more labor and probably contains as much or more material than any one of the pyramids. It was lost for centuries in an impenetrable jungle so that the only evidences of its age or char-

acter it carries in the sculptures that adorn it on every side.

Miles of country around it contain beautiful shrines, temples, and other evidences of the religious activity of a long forgotten age. In order to visit it we had to take a ride of two hours on a branch railway, and then one of four hours in a "sadoh" or native carriage. The trip, though wearying, pays.

We had one other long journey away from the railway. That was from Paseoran to the Bromo crater. This trip took three days and almost cost me my life. We were anxious to see the so-called "Sandy Sea" where the natives assemble every year to propitiate the god of volcanoes. The Sandy Sea is an immense extinct crater of what was probably, in its day, the largest volcano on the earth.

It is now a large level plain covered with sand that drifts into ripples. Being surrounded by a mountain wall of great height clouds gather there in imitation of billowy water. Within it are three volanoes that look to be almost as large as Vesuvius. They are Batok, Bromo and Widodaren. They lie a number of miles away from each others bases. The appearance of the Sandy Sea from its rim, gives one a good idea of the appearance of the moon as seen through the Lick telescope. Its surface is covered with just such craters within craters. We had a tiresome climb to the rim of Bromo, but thus obtained a view of its molten lava, its eruptions of smoke and ashes and its great size. Its open mouth is considerably larger than that of Vesuvius was when the writer made that climb.

On our return trip to the Tosari Hotel, we had the misfortune of having to face a tropical downpour. Being on horseback even our waterproof garments failed to protect us. We could not have been wetter had we been dipped in a river. At that altitude the air was so cold that when we reached the hotel our teeth were chattering in our mouths. Our changes of garments were at the hotel in Paseoran, twenty-eight miles down the mountains, and off at the railway on the

plain. There were neither fires nor fire-places in which to make fires. That is one of the distinctive peculiarities of all Javan houses. Not one of them shows a chimney on its roof, and none of them contain the slightest suggestion of a fire-place. The best we could do was to remove all of our clothes and wrap ourselves in the hotel bedding.

Following this experience the writer had a severe attack of coryza, aching eyes, aching muscles, a temperature of 103½ deg. F. and other symptoms of influenza. It came on soon after reaching the hot regions of the plains. From where did the germs of this attack come?

No one else in that region had it. The writer had endured a similar attack, that had undermined his health, before leaving America. Were the germs carried by me, in my condition of immunity, during all of the intervening months? Did they develop within me as soon as that severe chilling lowered my vitality? It looks very much as if this must have been the case. In our anxiety to get back to Batavia the disease was defied. Although the thermometer registered, on the train, 100 deg. F., during the mid-day hours, we pushed ahead. Here again we met with another surprise. My temperature sank below 100 deg. and my symptoms all became more bearable. With the approach of evening the weather became cool again and my pain was worse. Next day this experience was repeated with another decline in temperature and lessening of pain. No analgesics were taken. The attack cost me a very great pleasure and brought disappointment to the Dutch resident at Djokdjakarta. He was preparing to get together all the inhabitants of the town who understood English, for an informal meeting, in which we were to be the guests of the evening. When the time came I had to decline. He is a devoted believer in Mendelism and a great lover of Prof. De Vries. In my talk with him conversation turned upon Dr. Dubois' discovery, not far from there, of the skull of the Pithecanthropus erectus. In this way he discov-

ered that we were both interested in modern botanic and evolutionary problems, and after a long talk he insisted upon my meeting what he called "the best people" there. He wanted me to tell them something about Mendel's law and De Vries's Oenetheras. It was my intention to comply with his request, but at the last moment my suffering became so severe that it was impossible.

Hotel life in Java is sufficiently peculiar to merit description. It is, however, but an exaggerated form of the best class, Dutch life of the island. They need no elevators as all the buildings are low. The office is gen-

Dinner from a Traveling Restaurant, Java.

erally in a central building with the guests quarters all around, or on two or three sides of it, with garden plots between. Flowers, palms, flowering trees, flowering shrubs, and flowering vines are growing around in abundance. Many of them in imitation of the private residences, have menageries attached, in the cages of which they keep a number of the wild beasts of the island and some of the beautiful wild birds. The guests' rooms are always supplied with a liberal number of climbing lizards or chameleons, large ants, monster roaches, and occasionally snakes. The chameleons are never absent, so that as many as six or eight can always be depended upon as being fellow-lodgers in the same room, and immediately over the beds. Tree

frogs kept up an incessant croaking during most of the night.

All of the beds seem to have been constructed for the purpose of accommodating, at one time, all the members of a large family. Monster bolsters are supplied that it was long before we learned the use of. Finally

Side-view of one of the Terraces on the Ancient Temple of Boro-Boldoer.

we were told that they were intended to be placed between the sleepers in order to keep them cool. Every bed is canopied with mosquito netting, and before retiring a native servant comes with a feather duster, and sweeps out the mosquitoes that have gained entrance during the day. One species of mosquito there has no sing, but possesses

a very insidious sting. The first warning its victim gets is from the insertion of the latter.

Every bedroom has a bath-room attached, but it contains no bath-tub. The landlord has one or two of these tubs in reserve for such barbarian guests as insist on the using of so antiquated an article. The usual articles used in bathing are a large round vessel filled with water and a ladle. The bather ladles himself all over with the water and allows it to flow off upon the cement floor of his bath-room. Everybody is expected to do this kind of bathing several times each day. As no one dresses till lunch time, and, as, after lunch every one goes back to bed again till nearly 4 o'clock, there is not much extra trouble in taking such baths. Men, women and children go about without reserve, in pajamas and night dresses. It is the common custom. If one wishes to make a call on a friend the proper time is after siesta is over. If business is pressing it is permissible to go at about lunch time. In calling upon the resident, even when the call has to be made before noon, it is expected that the caller shall appear in full dress.

At the hotel dining-table everybody is expected, during the dinner hour, to be in full dress. This is likewise the style on all the ocean steamships that ply in the Orient. During siesta time the streets are practically deserted and the stores and offices closed. This occurs every day between noon and 4 p. m. Even the twitter of the birds cease at this time as they too seek shelter from the scorching sun. In front of every bedroom is a wide porch or veranda where rocking chairs and extension chairs are placed for the guests. At whatever hour the sun shines in that direction a heavy bamboo curtain is lowered to cut off its rays from over-heating that cooling resort. A single sheet is all the bed clothes that a hotel supplies unless more is called for, and the guests sleep on the top of that sheet most of the time. In the mountains blankets are supplies.

Our first experience in Java hotel life was

in the Hotel des Indes, at Weltervreden, the fashionable suburb of Batavia. Our first meal was "rys-taffel" or lunch. As we took our seats we observed, at the table to our right, a young Dutchman who was being waited upon by a string of eleven waiters. They all stood in a row and followed each other up as he helped himself to the contents of the trays which they bore. Before him was one large plate and into it went rice, condiments of a variety of kinds, vegetables in abundance, pork, beef, lamb, chicken, potatoes, and other things too numerous to mention. When the eleven waiters had passed, his plate looked like a small model of Fusiyama. He at once began stirring and kept it up until he had an almost homogeneous mass. We then watched to see if he would pour his coffee, milk and sugar in to complete the decoction, but he did not. He shovelled the compound into his mouth, chewed it and swallowed it with evident relish. A little later we tried a similar dish, found it made our mouths feel as if we had filled them with boiling water, and desisted before reaching the point of collapse. These eleven waiters took turns at serving all guests with this Dutch-Javan curry. It is so hot with red pepper and other spices that one has to get immune to its use before being able to avoid gastric inflammation

On reaching Java we expected to get some superb coffee. In our entire stay there we did not see a single cup freshly prepared. All that is served is fluid extract of coffee, made, perhaps, in some pharmacist's laboratory in Holland. Hot water is served with hot, usually, condensed milk in water and on the table along with the vingar, mustard and pepper, is a bottle of fluid extract of coffee from which the guest helps himself. On the tables are always placed a mysterious-looking iron box which on opening is found to contain a substance like punk. On blowing this it glows with fire and guests use it to light their cigars.

Although Java has no quarantine, it has had no cases of plague. The nearest ap-

proach to quarantining that tourists undergo is when they land at the port of Batavia, Tanjoeng Prijock. Here the police take them under their care, ask why they have come to Java, what their business is, how long they expct to remain in Java, what parts they expect to visit, what country they call their home, how old they are, etc. After the replies are recorded the visitor signs the page in evidence of its truth, pays his landing tax, and is told how to proceed in securing a passport that will save him from being further molested by the police during his stay. In all the trains he finds a warning to the effect that he must not leave Batavia or Soerebaya without this pass. These two cities are the chief towns of Java. They contain mostly crowds of Javanese, Dutch, Arabs, Chinese and Malays. The richest of the merchants are Chinese. The officials of the government are all Dutch. The Hotel-keepers appeared to be all Dutch, not only in Weltervreden, but likewise in Bandoeng, Djokdjokarta, Boro-Boedoer, Solo, Brambanan, Soerabaya, Paseoran, Tosari, Maos, Buitenzorg, and other places which we visited.

Only at Tosari did we find a doctor in connection with any hotel. There we learned that Batavia is the most unwholesome part of Java and has long been popularly known as "The Dutchman's Grave." The chief trouble there, as well as in all other parts of this land, is malaria. Diarrhea is also common. Goitre is frequent. There are some lepers among the Chinese. In former times the natives made short work with leprosy by killing its victims or driving them out into the forests to starve. They know nothing about diphtheria or scarlet fever and erysipelas, mumps, whooping cough, typhoid fever, pneumonia, etc., are curiosities among them. They have rheumatism, measles, phthisis and smallpox. The last named is much less frequent since the introduction of vaccination, than it was before. A serious skin disease known as Yaws is very common among all the Asiatics, but

seldom attacks Europeans. The natives are nearly immune to malaria and when infected by the mosquitoes the attacks are mild.

Under Dutch rule they are free from the exposure, poverty, and privation that once killed them off so that now they are increasing in numbers with great rapidity. They live an easy, comfortable, satisfied life, knowing little or nothing about the great world that surrounds them. It is the policy of the Dutch government to keep them ignorant in order to keep them docile. So far this policy has worked well. There are no insurrections and no one has raised the cry of "Java for the Javanese." The Dutch do not propose that such a cry shall ever arise there. A number of Dutch gentlemen with whom we talked declared that the United States is paving the way for no end of trouble by its policy of education that we have begun in the Philipines. They predict death, disease and great destruction of life both to our own people and to the Philipinos because of it. They declare that every school house we establish will become a nursery of insurrection and insubordination. They say that the liberty we give our soldiers and sailors will carry diseases to the natives that must in time serve as they served our American Indians.

While this view is evidently overdrawn it is possible that there may be something to it. Our experiment will stand in broad contrast with that of the Dutch. We have adopted an entirely opposite policy and only the future can tell, with certainty, what the harvest will be. The brewing discontent of India shows that the half-conciliatory policy of Great Britain may, in the long run, prove to be a bad one. Will ours save our tropical wards from disease and death? Does education educate in such a direction?

VISITING FAR CATHAY.

When the history of civilization comes to be written from an evolutionary standpoint China will supply much of the foundation data. It was all very well for Tennyson to say: "Better fifty years of Europe than a cycle of Cathay," but the fact nevertheless remains that to that country we owe many of the suggestive ideas that have led us to our present position of civilized greatness. When our fathers were in a condition of semi-savagery China was about as far advanced as it is today. Unfortunately for it and for its people, the conservative element became so strong that it throttled further progress and left the nation sessile for over a millenium. The tendency to repudiate new ideas and to adhere to those of our fathers is quite as strong among some Americans as it is among the Chinese, but fortunately for us we have a large sprinkling of men who are capable of independent thought, and who refuse to allow their brains to be moulded entirely by the popular pattern. In seeing China with Western eyes the lessons that we can derive from its study will be the greater if we keep clearly before us the fact that as it now is we once were. In medical matters it is only necessary for us to go back a few generations in order to find our forebears practicing what was practically the same kind of mummeries for the cure of diseases as they now do. Until Europe and America were emancipated from the sentiment that looked upon a human corpse as something awfully sacred, and that ought not to be defiled by the scalpel of the anatomist we made no progress of any importance. As long as it was deemed as great a crime to dissect as to

murder, medical science had to take a back seat, and as long as medicine was hindered all true progress was arrested. To the credit of the medical profession it must be said that the vast majority of the fertilizing ideas which brought progress were born within the minds of men who bore the degree of M. D. This is not only true for medicine and physiology, but it is equally true of physics, chemistry, botany, zoology, geology, and paleontology. Even astronomy would cut a sorry figure if the contributions made to that science by medical men were removed. The static condition of China can be clearly traced to the lack of initiative displayed by those who practice the healing art among the people. A careful study of this condition, as it exists today, will give us a key to some of our own unsolved problems, by reason of its contrasts with ours.

PECULIARITIES OF THE YELLOW MAN AND HIS COUNTRY.

Our visit to China included calls at Hong Kong, Canton, Maceo, Shanghai, Nankin, Hankow, Pekin, Nankou, Tientsin, Shan-Hai-Kwan, Nieu-Schwang, Dalny, and Port Arthur. This included a long steamboat trip of over 600 miles into the interior of the country and another long overland trip from Hankow to Pekin of 900 miles by rail. Following this was still another round-about railway journey into Manchuria and the Liao-Tung Peninsula of over 500 miles. These several trips gave us a fair opportunity of seeing the various parts of the country and studying the differences in the people inhabiting them. Each province of China speaks a different dialect and differs from the rest in many minor particulars. We passed through nearly a dozen of these provinces that are politically related much as our States are to each other. For several days at a time we saw no whites except those travelling with us. Everywhere the long queue and sallow face were in evidence, but it was easy to detect a marked difference in the features of the people at points re-

mote from each other. The sail up the Yangtszekiang and the crossing of miles of sand bars on the Hoang Ho, added zest to our inland experiences. Most of the country between Hankow and Pekin is much like that of Illinois, but it differs materially from Illinois in that there are no fences, no wide roads, miles on miles of poppy fields rich in colored blossoms, and not a sign of a weed of any kind, through hundreds of miles of territory. The perfect cleanness of the crops of all kinds was a remarkable revelation. There is nothing like it in any other part of the world. The only division lines visible were those made by the different kinds of crops.

SUPERSTITION AND REVERENCE.

In every direction, through all the fields, could be seen the graves of the dead. Sometimes one or a few graves were together and at other times a group of them stood alone surrounded by a few trees. All the villages were likewise surrounded by trees in a similar manner. Crops were planted up close to the graves and up close to the shade trees of the houses. In those scattered graves we find the secret of China's degeneracy and China's weakness. Radiating from these is all the light that the average Chinaman is ever willing to allow entrance to his brain. Every grave is a shrine and every shrine a sanctuary. His ancestors are his gods and to their spirits his prayers incessantly ascend. It is curious to note how the shapes of the graves of all the world vary step by step, according to the greatness of the dead person, until they approach in appearance the church, the temple and the cathedral. The transition can be traced by beginning with those of China and comparing with those of India, Egypt, Turkey, and Europe. The Chinaman accepts every grave as a shrine and place of worship because his ancestors inhabit them. Farther west and the worship continues, but the idea of the grave is almost or quite lost. To the Chinaman it is the central idea of his philosophy and the ruling thought of his

entire life. He believes that he is in incessant danger from the spirits of demons and of enemies. Like our fathers he considers it a sacrilege to do anything that is likely to disturb the peace of the dead. The same spirit that made it so dangerous for doctors to dissect in America, makes it dangerous to injure a grave in China. The chief opposition to railways is their trespassing on the rights of the dead. The bitter hatred toward white men is due to the lack of reverence to their ancestors as seen in these railways and in the high buildings that Europeans erect.

Chinese Funeral, Shanghai.

The former desecrate the graves and thus bring ill luck upon the people and the latter by exceeding 99 feet obstruct the passage of all good spirits who come to bless them and only allow passage-way for demons.

All walls, temples, and houses must stop at 99 feet for the celestial path over which angels walk is exactly 100 feet from the ground. In Pekin every pavilion surmounting the city walls stops short at 99 feet. In no Chinese city are high buildings erected. The Pagodahs that are seen on hills and along rivers sometimes reach to or exceed the hundred feet, but these are looked upon as some sort of conductor of blessings from the

good spirits. They are all very old and are believed to have been erected by the early Brahmin missionaries as depositories of the relics of saints. To present Chinamen they are conductors of good luck to the regions surrounding them. They are always either 7, 9, 11, or 13 stories high. None are known to contain an even number of stories. Each story is supposed to represent an open, sacred Brahminical umbrella and the more stories up to 13, the greater the amount of "merit" the edifice is supposed to bring to all the region over which they can be seen. Most of them are nine stories or less. They are all going to ruin, as nothing is being done to preserve them. But the pagodahs are not the only sources of good luck for the Chinese. They have numerous temples to which they resort in order to pray for this article. The early Portuguese called these Dios Houses, i. e. god houses. Later European visitors corrupted this to Joss Houses, because the Portuguese pronunciation of Dios sounded like Joss. Nor do the Joss houses exhaust their resources as places for praying for good luck. A walk through any native business street in Canton, Nankin, Shanghai, or Pekin will reveal the fact that every store has its own shrine.

DOCTORS AND DEVOTION.

Imagine an altar for prayers attached to every place of business in our American cities and the reader will have some sort of an idea of a Chinaman's faith in and devotion to his religion. Here they pray for good business, good health and general good times rather than for their soul's salvation. When sick they have more faith in prayers than in science. The priests have supplemented the prayers with lotions and potions and have instructed them in a ritual that is calculated to draw fees out of them in a way that is certain and not aggravating. They have taught the supplicants for health and wealth to buy fragrant joss sticks and paper representatives of money that must be burnt before the altars to propitiate the spirits. The more they

burn the more certain is their restoration to health supposed to be and the larger is the fee to the priest.

In the temple of Cho Sing, at Canton, one can see great numbers of people every day, prostrate before the idols, begging for health among the fumes of burning incense. Mothers go there to pray for their sick babies, wives for their sick husbands, and children for their sick parents. After completing their prayers they go to another part of the temple where they find a bowl filled with numbered pieces of paper. At random they draw a number as in a lottery. This number has a filed prescription alongside with a corresponding number. This prescription he takes to the temple drug counter and has it compounded. Usually the medicine is exceedingly nauseous, at least so the guides told us, but it must be faithfully taken or the patient cannot hope to get well. If this prescription from the temple fails to bring relief a visiting doctor may be called to the house. He makes his rounds in a sedan chair that being the respectable way of travelling in that country. The coolies that carry the chair recognize the house by *a copy of the doctor's sign-board* that has been placed in front of the patient's door. As soon as the doctor enters he is proffered tea and a pipe, after partaking of which he feels the sick one's pulse. By the pulse he is supposed to be able to tell where the trouble is located and what its nature. According to the Transactions of the China Branch of the Royal Asiatic Society of Hong Kong, the pulse is felt at three points up and down the wrist. The upper pulse of the left wrist when lightly pressed tells the condition of the small intestines. When heavily pressed it tells the condition of the heart. The middle pulse of the same wrist if lightly pressed gives the condition of the gall-bladder, while if heavily pressed it tells the state of the liver. The lower pulse of the same wrist gives the condition of bladder or kidney, according as it is pressed lightly or heavily. The right wrist is gone over in a

similar manner so as to find out the condition of intestines, lungs, stomach, spleen, and two organs unknown to our anatomy, but called by them "san tseaou" and "ming man."

CHINESE ANATOMY.

As Chinese medical students never do any dissecting, their ideas of the structure of the body are not much like ours. They are taught that the small intestines are connected with the heart; that the urine reaches the bladder from the small intestines large; that

Medical Stores, Shanghai.

large

the intestines have sixteen convolutions and are connected with the lungs; that the kidneys are attached to the spinal marrow; that the liver is the seat of the soul, that courage is a secretion of the gall-bladder, and that food goes to the spleen and passes from it to the stomach. When an organ is diseased it is due to bad humors or to evil spirits. Until the latter are subdued medicines are of no avail. In spite of such crude ideas Chinese doctors gain, through experience, some really good and practical ways of handling some ailments and of performing minor surgical operations. Obstetric practice is almost entirely in the hands of women.

DRUGS AND DOSES.

Every Chinese city contains a large number of drug stores that stand as evidence of the great faith the masses have in drugs. Many of the drugs they sell in such stores remind one of the old remedies of over a century ago among our own race. Quite a large proportion of their mineral remedies are much the same as ours. It is said to be a common thing for patients to cast lots so as to find out which one of a dozen doctors their good spirits want them to visit when sick. After getting a reply from the spirits in this way they will go to the doctor and bargain with him regarding how much they must pay in order to be well and how quickly the cure shall be wrought. Should the doctor take the case to be a difficult one he will order gallons of the most nauseous remedies he can think of, to be taken within the specified time, and having secured his fee in advance he pays no more attention to his patient. If the latter is not cured at the agreed upon time he scolds his doctor, scolds his spirits, goes to another shrine or temple and prays for further directions and then repeats the operation.

TEMPLE OF THE FIVE GENII.

In Canton there is what is known as the Temple of the Five Genii. It was erected about 500 years ago and is dedicated to five good spirits who are supposed to have visited that city 2000 years ago, mounted on rams. Tradition declares that when these spirits were passing the market-place they said: "May famine never visit this place." Because of this it is said that Canton has never had a famine, and throughout China it is known as the City of Rams. Since the Five Genii happened to be the ones who preside over the five elements of fire, water, earth, metal and wood, and since these are the supposed elements out of which the human body is constructed, the claim is made that Canton is the most healthy city in China. The genii we are told, keep these elements in

proper proportion for health within the bodies of those who choose to reside within their favored city. Whether or not Canton is any freer from disease than any other of China's great cities it would be impossible to say, as no statistics are obtainable. Europeans, however, say that in spite of its narrow, dingy streets, its small, unventilated or badly ventilated homes, its uncared for sewerage, its numerous unpleasant odors, and its millions of inhabitants, there do not appear to be any more funerals than in any western city of equal size.

TUBERCULOSIS IS NOT PREVALENT.

What is, perhaps, more remarkable is the scarcity in the streets of persons showing signs of developing tuberculosis. According to our notions regarding the predisposing causes of this disease one should meet more such cases there than in New York or London. In Canton there is more herding together of great numbers in small, stuffy rooms, more real poverty among the masses, more exposure to dampness, strain and other depressing influences, and less knowledge of hygiene. When Chinamen visit Europe or America they show themselves, on an average, more susceptible than Caucasians. When at home far fewer of them suffer. With us it is the poor who suffer most. In both China and Japan it is the rich who are the chief sufferers. As regards the conditions of life among the poor the following description of a street scene is copied from my diary and was written immediately on reaching the hotel: "We have passed to-day numerous little girls loaded down with their younger brothers and sisters tied to their backs. Many of them could not be over five years old. As we came from the steamboat we saw at least twenty mothers rowing sampans, loading and unloading heavy goods, hoisting sails and doing other heavy work with babies tied to their backs. In every shoe store (and there was a multitude of them) we saw boys of from four to six years of age sewing on the heavy leather soles of shoes. It seemed ex-

ceedingly hard work for children of such tender years. In every street we passed toddling youngsters under heavy loads of merchandise, of building material, and of goods from the market. They carried them in baskets or boxes, suspended like the beams and pans of a pair of scales, upon heavy bamboo sticks that rested on their shoulders. Such children would not have been permitted to do any kind of work in our country, much less being forced to support and carry weights that made great beads of perspiration pour down their naked backs, and caused them to pant and strain with a weariness of limb that they could not disguise."

QUEER SIGHTS AT THE MARKET.

One of the queer sights of this strange city was the marketers. We passed numerous men, women, and children leaving the market-places with their purchases in their hands. And such purchases! Many of them had a piece of meat no larger than their thumbs, an onion, a carrot or other vegetable, with, perhaps, a tiny piece of bread, all strung together and suspended by a string from their hands. Nothing was covered with paper. Every purchase was visible to every passer. One lad passed us with two small, living fish tied together by their bleeding fins and an onion and a small head of lettuce on the same string. The fish were no larger than sardines. Great numbers of the passers had little slices of fish, others slices of meat of tiny dimensions, tied to some small vegetable. Some carried each a frog, a crab, or one or two shrimps, along with small portions of vegetables, green ginger, peppers, or string beans. Everything in the market-place could be bought in portions worth as low as one-fifth of one cent in value. Itinerant butchers, bakers, grocers, etc., peddled all sorts of provisions through the streets and sold portions so minute that it was a wonder to us why the purchaser got them at all. It seemed like the making of many bites of a single cherry. "Ripe" eggs that had been buried in the ground

for weeks, so as to gain flavor, appeared to be a great delicacy. Dog and rat meats are sold to those who are too poor to buy better articles. Appallingly dirty looking combinations of rice and sugar seemed to be in considerable demand, but the chief "confection" was sugar-cane that was purchasable in amounts so small that one Chinese "cash," their lowest denomination of monetary value, could buy. In every part of the city, and during every hour of the day, we passed great numbers of people enjoying these small pieces of sugar-cane or eating rice. Meal time seemed to be all the time. Merchants sit in their stores eating rice and drinking tea when not waiting on customers. They do this in the most public manner possible.

CHEERY DISPOSITION AND FANCY SIGNS.

The streets are so narrow that the chairs in which we were carried left scarcely room for pedestrians to pass and when other chairs met ours one or other had to turn into a side street or a store door to let the other pass. Every person met seemed to be good natured, much to our astonishment, as we had been led to believe that the Canton Chinese looked upon the visiting "Fan kwei" (i.e., foreign devils) as creatures to be despised or insulted. Nowhere did we see a scowling face or hear what appeared to be a disrespectful utterance. We saw many smiling faces, although we had been told that Chinamen were always stolid and never smiled. Only once did we have to give the right of way to others. Always the Chinese gave way to us to let us pass. The exception was when the Governor of the Province and his officers came along. Then every body had to step aside. There were no wagons, carts, carriages, pack animals, or vehicles for merchandise seen in any street. It would have been impossible for an elephant or camel to have made its way through many of them. The former would have been too wide and the head of the latter too high. The forest of signs that hang pendant from above or sup-

ported by their sides is something wholly unlike what is to be seen in any other part of the world. Every store has many of them. They all hang long-way downward instead of as with us in a horizontal direction. They are from six to eight feet long and from six to nine inches wide. In the better parts of the city they are handsomely carved, painted and gilt. The favorite color is red with large gold characters, but some are black, some green, some yellow and quite frequently the basic color is gold with the letters crimson, green, or black. They must take great pains to keep them looking fresh and new for we did not see one that looked shabby or old. They completely filled the space between house and house overhead, so far as vision was concerned. They left no gap through which an observer could look for a single block down any street. The effect was rather pleasing than otherwise, principally because of their new and clean appearance. In the poorer parts of the city cloth signs of a similar character took the places of wooden ones. Those who were initiated declared that they could tell the kind of business of most stores by the shape and color of the sign. None of the signs contained the owner's names as is the case with American ones. Each store, however, bore some fanciful name. One, as translated for us by our guide, was called "The Heavenly Jewel," another "The Everlasting Harmony," and still another "The Abode of Joy." A drug store was labelled "The Hall of Everlasting Harmony," and a tea house "The Chamber of Fragrant Almonds."

THE FOREIGN CONCESSIONS.

In all of the large cities of China that we visited the scenes in the native quarters are like these we have described for Canton. But most large Chinese cities contain parts, known as concessions, in which Europeans reside. They are sections given outright to or rented by the foreigners. In the German concession the visitor is practically in German territory, where Germans reside and do

their business, with German police, German soldiers, a German postoffice, German courts and German judges who try all cases. In the English concession everything is English, and in the American concession everything is American, even to carrying American letters home with American stamps.

Maceo is wholly under the control of Portugal and Hong Kong under England. The former is the Monte Carlo of Asia where gambling is deemed a virtue. The latter is an exceedingly handsome island, surrounded by bewitching scenery, and contains one of

Victoria Hospital, Hong Kong.

the prettiest and most modern granite built cities in the world. Its proper name is "Victoria," but it is generally spoken of as Hong Kong, after the name of the island. Shanghai, while quite interesing in its way, is less beautiful than Victoria, less free and easy than Maceo, and less bizarre and curious than Canton. Nankin is almost a duplicate of Canton, and Hankow is quite like Shanghai in those things that attract the attention of tourists. Pekin is a disappointment, chiefly because the parts that travellers desire to see lie within the forbidden city and cannot be seen. It is, by all odds, the dustiest city on earth. In April and May the dust is so thick that one can scarcely see a block ahead and after a half day's sight-seeing a ne-

gro, however black, and a white man, however white, would look just alike. The prespiration makes the dust adhere to face and hands in thick, grimy coats. The trip from Pekin to the Ming tombs and to the great wall is comfortable enough as far as Nankou, but when the Kalgan Pass is reached the ride through that is rough and dirty. The travel through that pass is immense, and one is constantly wondering where such great multitudes of people, camels, donkeys, and horses come from. We are told that it was at one time paved with granite blocks, but now there is no road other than the ruts and no ruts, but are broken up with boulders. At each swirl of dust one has scarcely time to take a breath of air before another arrives to choke or smother. Many of the Manchurian travellers that we passed looked in features more like ourselves than did the Chinamen of Southern and Central China. The scenery along the way is much like that of our own Rocky Mountains, but without our snow-capped peaks.

THE GREAT WALL OF CHINA.

The Great Wall, both here and at Shang-Hai Kwan where we visited it a week later, is an interesting object. It has stood for more than two thousand years and still looks as if it might be made a defense of great value. No mountain was so steep, no ridge so high that those old builders did not undertake to conquor. It is probably the most gigantic piece of engineering that the world has ever constructed. Let the reader picture to himself a huge wall, varying from 15 to 30 feet high, and having a thickness of 25 feet at the base and 15 feet at the top. Surmount this with tall watch-towers and place alongside it still other taller watch-towers forty feet high, forty feet square at the base, and thirty feet square at the summit. Have such a wall built of bricks weighing from 40 to 60 pounds each and faced with a coping of granite while its interior is gravel and clay. Now run such a tremendous wall over mountains, through valleys, across rivers and after

a distance of 1,500 miles end it in the sea. Such is the Great Wall of China. It looks the wonder that it is as one follows its serpentine windings up and down the hills and mountains over which it passes. In one place it crosses over a mountain peak 5,225 feet high. The numerous interspersed watch-towers give it a pretty as well as a formidable appearance. If transported to our country and put up for our people to see it would extend from Philadelphia to Topeka, Kansas.

EVOLUTION OF CHINA'S EDUCATIONAL SYSTEM.

As has endured the Great Wall, even so has endured the educational system of ancient China. Every great city of the empire has its Kung Yuen, or Examination Hall, where the young men of the government came to be examined in the Chinese classics. The one in the East Tartar City of Pekin contained 10,000 tiny compartments where competitors were kept, at every annual examination for a day and two nights, in solitary confinement. In 1905 this system was abolished after having stood, like the Great Wall, for over 2,000 years. Now modern scientific education is accepted as of equal value with the classic and diplomas from Harvard, Yale, Columbia, Eaton, Cambridge, Berlin, and many other leading American and European colleges are placed upon an equal footing with their own. The latter too has changed to conform with modern ideas, and no one is permitted to pass the competitive examinations who has not added modern scientific knowledge to the list of his attainments. How great this change, is can be seen from the following statement of an Englishman named Fraser who visited Yunnan a few years ago. He says; "The students asked me; "Have you a sun in your country like the one we have? Have you trees and rivers, and are they like ours? Is it true that there are barbarians who have no knees to bend, that they have to sleep leaning against the wall, for if they lie down they are not able to rise again? Is it in your country where people have holes through their chests, so that ser-

vants can carry them from place to place swung on poles? Do you have examinations in your country'? To this last question he replied that they had, and then the interogator replied: "Then I suppose some of our wise Chinese men must have been over and taught you the way." When questions of this kind could be asked by men who were up for examination in the highest knowledge of the Chinese Empire, what can be the depth of ignorance of the great masses of the people?

PROGRESS IS PROGRESSING!

But even they are learning. A few months before we reached Tientsin a movement had started to put an end to the annual offerings to the dead at the feast of All Souls. Following this propaganda came an edict from the Chinese commissioner of police forbidding this ancient rite, and advising all progressive Chinamen to donate the money intended for that festival to the educational fund "with a view of equipping themselves and their families for the exercise of electoral power." When he forbade so ancient and so sacred a rite it is pretty certain that he felt that he had good backing both from the people and from his superiors.

MILK AND TYPHOID.

But progress in China is not all clear sailing. It has its penalties. As we have already seen tuberculosis appears as if it might be an accompaniment of western civilization. Nor is it the only one of the western plagues. Shanghai, Tiensin, Hankow and Hong Kong are awakening to the fact that scarlet fever and diphtheria have appeared among their children and is slowly taking hold of the children of the rich Chinese. Typhoid fever, too, is increasing and is no longer the rarity that it once was. In the interior of China the two first named diseases are said to be unknown while the latter is so rare that skilled European physicians have doubted or denied its presence among the natives. The only co-incident fact that seems to parallel the appearance

and growth of these diseases in China and Japan is the adoption by the natives of the use of milk. As Brahmins they were averse to its use. With the dying out of the old faith comes the using of milk. They begin with condensed milk which, of course, is sterile but it is not long before they become users of fresh milk and get their supplies from a common stock. Ice cream, charlotte russe, morangu pie, and other milk delicacies, find their way into Chinese homes to be eaten by Chinese children. Is this the source of the trouble? In view of the vast array of facts contained in Bulletin 41 of the Marine Hospital Service of the United States, it looks as if this might be the true explanation. It is quite certain that where milk is not used, there these diseases have not made their appearance while coincident with the growth of the use of milk has come the diseases. The trouble began first in the "Concessions," and it was some time before cases were ever heard of among the natives. In the interior milk is still looked upon with aversion and even disgust. It is said that there are large numbers of the people who would almost as readily try to eat human flesh as to taste of milk, but progressive Chinamen fling defiance at their conservative countrymen and pride themselves in airing their heterodoxy by a display of its use.

POLITICS AND RELIGION.

Progress in China is not all easy sailing even when it is being pushed by men close to the throne. The Boxer uprising of a few years ago was evidence of this. The intense hatred that the Boxers displayed towards foreigners is fundamentally religious, but partly political. Every step of progress is a step of desecration, inasmuch as it uproots all their hopes of the hereafter, all their dreams of the present, and all their conceit of their own superiority over other people. They see the "foreign devils" gaining rights from the government at Pekin that they cannot get. They see their sacred shrines torn and defiled before their eyes in order to make way for

means of locomotion that they do not desire. They see the men who have abandoned the faith of the fathers promoted to high positions. They see even the detested "fan kwei" advanced to positions of honor and of power that they covet, but cannot get. How long could such conditions endure, even in peaceful America, without provoking revolt. Let the disciples of Ingersoll and of Thomas Paine gain the upper hand here; let them tear down churches, stop religious processions, introduce social habits repugnant to the spirit and letter of Christian faith, and encourage the invasion of the country by foreign nations seeking to divide up our

Funeral, Pekin.

states among themselves and how long would we remain passive? The leaders can see the strength of our argument at the cannon's mouth, but the masses know no more of the greatness of the outside world than do children of ten or twelve years of age. When the Allied Forces invaded Pekin patriotic Chinamen were more than astonished at the result. It was their firm conviction that China would win. They sincerely believed that they would be able to drive every foreigner out of their country for all time. Some of them cannot, even now, understand how they were so badly defeated, or why the throne was restored to them again after that defeat.

SUSPICIOUS JAPS.

From Pekin, through Tientsin, to Ying kau, we had a three day's railway ride through the Boxer country. The last half of the way was through a very hilly region while the first half was coastal lowlands. Evidences of the uprising were still to be seen and German, English and American flags were still floating over a number of the towns with here and there small encampments of European soldiers. On reaching the Liao River we knew we were in Manchu-

Old Russian Red Cross Hospital at Port Arthur.

ria, the site of a still more recent and dreadful tragedy. When leaving home we were uncertain as to whether or not we would be permitted to enter this part of the country. The Japanese consul, at New York, was very doubtful about it, but thought that perhaps by the time we reached there tourists might be permitted to visit Port Arthur. We went ahead and found that while we were watched at every turn by Japanese soldiers, and were compelled to repeatedly tell who we were, why we were there, and how long we expected to remain, no attempt was made at molesting us or hindering our movements.

In Nieu-chwang the masonic fraternity was having a banquet at the Manchuria Hotel where we stopped. They had just dedicated a new temple there. Learning that the writer was a mason they insisted upon my attending and enjoying the repast. In conversation with several of them the fact was learned that among the foreign population there was general dissatisfaction at the way the Japanese were managing Manchuria since the expulsion of the Russians. Europeans and Americans, through China, Corea and Japan, all seem disappointed at the treatment the Japanese have been according them. They had sympathized with Japan in its struggle with Russia only to discover that the latter was treating them with less fairness than even the Russians did.

Manchuria has long been a bone of contention between the Powers. Russia had, for centuries, been extending her domain eastward and, within the lifetime of the present Czar, had set her heart upon this region as a means of making herself a great world power. The Russian southern fleet was tied up in the Black Sea and forbidden to pass the Bosphorus, their northern fleet was frozen for some months of each year in the Neva, and their eastern ships of war were icebound for half the year at Vladivostock. Thus crippled what wonder that they should covet the ever-open ports of the Liao Tung Peninsula? Beginning with an eighty year lease of the region, obtained from China by what was practically coercion, M. de Witte, the Russian minister of finance, played the part of Aladdin to perfection. By a rub of his wonderful lamp he ordered the immediate construction of a modern city on Ta Lien Wan Bay. Never before, in the history of the world, was a miracle like this wrought. Churches and workshops, barracks and navy yards, stores and homes, hospitals and parks, wide streets and fine buildings, covered acres on acres of ground at his mere command. Millions of dollars were spent in the work only to prove the truth of the old adage that

"there is many a slip between the cup and the lip." Not one of the fine edifices was destined to be the abode of a Russian. Their land lease will not expire till March 27th, 1922, but in the meantime their every hope has been extinguished and beautiful "Dalny" is now a Japanese city and known as Tai Lien. Our trip there was beset by many difficulties, owing to the imperfect railway facilities and to some rather unpleasant Japanese habits, the description of which would not look well in print. It was a hard journey for a lady to take. Knowing that it would be after dark when we reached Dalny we telegraphed ahead to the Toyo Hotel for a guide and conveyance. Two hours later a station master, at a way station, returned our money with the information that there was no messenger at the Dalny station, to send to the hotel, and so the message could not be delivered. This, at least, was what we understood from his signs for we could not speak to each other. Through much tribulation we found our way all right and were made happy by being greeted in our own tongue by the American consul, Mr. Chandler, who, on learning that some Americans had arrived at the hotel, came to welcome us. Next morning he returned again, and on learning that we desired to visit Port Arthur he placed his interpreter, J. Iberaki, at our service for two days. This kindness proved of great value to us and made our trip one of intense interest. Without his help we would have found it difficult to have bought our railway tickets here. No Chinaman or Japanese seemed to know the name "Port Arthur," that being an exclusive Caucasian title. The local name is Riojun. Long before reaching the city our train passed through battle scarred hills, among dismantled forts, and near to the landing-place of the Japanese forces. After closer examination we wondered how Nogi and his men succeeded in forcing their way into so well defended a region. Nature and art had both conspired to make the place impregnable. Guarded by hills and forts from the sea; en-

circled on every side by steep declivities and not an inch of ground in sight on which cannon balls and shell could not be showered, nothing short of starvation should ever have compelled Stoessel to have surrendered. From 204 Metre Hill the view is magnificent and from it guns could be trained along the direct path of the Japanese forces. Japan silenced those guns, and now nothing but wrecked masonry marks the spot where they stood. Nothing has yet been done to restore any of the forts around the city, but on the morning in which we ascended 304 Metre Hill, early as was our hour of departure from the hotel, a Japanese officer followed us in a carriage to the foot of the hill, and then climbed after us to the summit to see what we were doing up there.

In the small harbor of Port Arthur three of the thirteen sunken Russian ships of war were still lying there. What a terrible story of death and destruction those ships and those dismantled forts now tell. Great as was the loss of life on the field of Gettybsurg, momentous as was the issue and the results at Waterloo, famous as was the victory at the battle of Blenhiem, none of these showed such horrid carnage as that sustained by the Japanese at Port Arthur.

Well might this people paraphrase the words of Wellington, at Vittoria, Spain, when on casting his eyes over the battlefield he exclaimed: "The next most dreadful thing to a battle lost is a battle won." Here it would almost seem as if the next most dreadful thing to a battle won would be a battle lost. And all this, and the other almost equally sanguine battles of Manchuria, came about soon after we had learned, in America, that Russia and Japan had come to terms of peace, that China was about to be carved up between the Great Powers, and that our efforts as a nation at keeping an "open door" for commerce was at an end. The supposed agreement of November, 1903, was followed by war in February, 1904, and all because of Russia demanding that Japan surrender its paramount interest in Corea. Did we have

anything to do with Russia's refusal to let Japan have Corea? Our pledge to defend Corea against aggression placed us then and places us now in a very awkward position, in respect to Japan.

KOREA AND JAPAN.

On leaving Dalny we had our first experience on an exclusively Japanese ship, the Shinanogawa Maru, a small coasting steamer that made the rounds of the Yellow Sea and its tributary bays. The food being only Japanese we had to subsist upon sandwiches which we brought from the hotel at Dalny. The human passengers were few but the berths were already occupied by a multitude that the Buddhist stewards did not attempt to evict. On reaching Chemulpo the port physician made a careful examination for bacterial infection, but paid no attention to that more palpable kind that had made our flesh crawl many times after discovering its presence. On landing at Chemulpo we soon learned that the Japanese had rechristened it Jinsen and on buying our railway ticket for Seoul we learned that this too had been renamed and is now known as Nandaimon. Later in our tour we found that Fusan had met a like fate, and is now the port of To-So-Ryo. We thus perceived that every known landmark of our tour through the Hermit Kingdom was practically obliterated from our American maps.

The Japanning of Korea does not stop at this as was soon discovered. Every effort is being made toward the Japanning of the people and that there should be resentment is not to be wondered at An effort had been made to force the Koreans to abandon their characteristic costumes and adopt those of Japan. This had led to so much trouble that the enforcement of the law had stopped just prior to our visit, but the irritation remained. The Koreans wear mostly white garments and the Japanese passed a law making it a crime

for a man to be seen in the streets with white clothes. The prisons got so full that they could find no places for the pressing multitudes of such criminals. On the plea that white cotton goods cost less than colored cotton goods, and that the peasants were unable to pay the difference in the cost the law was repealed and the prisoners set free.

We spent half a day at Chemulpo jinriksha riding so as to see the sights of this strange country. The city itself differs but little from a sea-port town in Europe or America, but the people and their ways differ very materially from anything we had yet seen. Men with rimless and half-crowned hats, others with tall cone-shaped, fluted-edged hats, others still with hats like inverted bowls, and all appearing as if just out of bed with their sleeping garments on, made a rather unique sight. Women with long sticks like alpenstocks and low cut gowns of pure white that left the breasts uncovered, accompanied by children having garments of pieced-colored cloths, one sleeve or front of which would display from ten to twenty brilliant colors, was no uncommon sight. The men wore queues, as Chinamen do, but not hanging down their backs. They are invariably rolled up under their strange shaped hats in a coil and can only be seen when they happen to stoop over. The hats that are not cone-shaped, being half-crownless, permit one to see the coiled rope of hair.

But a Korean funeral is probably the most comical thing one can see in this queer country. The coffin is decorated with colored ribbons and artificial flowers. The pall-bearers are painted and ribboned, rosetted and flowered, like exaggerated clowns for a circus. Mourners and pall-bearers dance, shout, and grimace on their way to the graveyard. Two persons are converted into one giant form and a number of these giant forms, in which one man stands upon the shoulders of another, likewise make a dancing movement as they proceed. We happened to be the unfortunate cause of the breaking up of a funeral procession of this kind. A few

mocking Japanese coolies were set upon by the mourners and flogged for their irreverence. Our Japanese jinriksha-men dropped their places on our jinrikshas, seized the long walking canes of some Korean women, wrenched them from their hands, made a dive into the funeral procession, thus re-enforcing their countrymen, and played havoc among the mourners. The suddenness of the attack took them by surprise and brought immediate victory for the Japanese. For a time we feared that we would have to find our way back to the railway station afoot, but by and by our men appeared with only a few scratches as a result of the melee. Had the attack occurred in a crowded part of the town instead of in a quiet suburban region it might have proven much more serious for us. We afterwards were told that this sort of thing is of frequent occurrence in all parts of Korea.

The railway trip to Seoul is through pleasant but not markedly diversified scenery. Many miles of the way the fields and forests, houses and rocks are decorated with huge advertisements, in all sorts of gaudy colors. The characters being entirely oriental tourists can only guess at their meaning by the pictures that most of them bear. In number and conspicuousness they outrival anything seen along New York, Paris or London railway routes. This kind of advertising we later found is quite common throughout Korea and Japan. The stations all bore both English and Japanese signs giving their names. The tickets were printed on one side in English and on the other in Japanese, but all names, on both tickets and stations, were different from any on our maps or guide books. The new names are Japanese and the old ones Korean. When we reached Seoul and were told to leave the train it was something of a surprise to us to hear the place called out by the conductor as "Nandaimon," and yet that was the name which our ticket bore.

Our locomotive and the cars on our train were made in the United States, so that dur-

ing the journey there was a home-like character to the ride, but we found it more fatiguing than riding for a similar distance on the English-made cars. One of the first sights of Seoul that attracted our attention was the trolley cars of the American-Korean Electric Company. During our stay in the city we seldom saw them when they were not well filled with Korean and Japanese passengers. The Korean costumes in Seoul were of the same odd character seen in Chemulpo and on the way to Seoul. The city as a whole has a pleasant, oriental-occidental look, but contains nothing impressive in the way of architecture. The palaces and palace gardens are the chief sights. While of great interest when viewed in their semi-barbarous greatness as a phase of human evolution, they do not appeal to visitors as being in any sense beautiful. The streets are much wider than those of Chinese cities, the store signs are less showy, and the people appear to be less demonstrative. Most of the houses have two openings on the sidewall, or on the gable end, from one of which—the upper one—issues smoke, and from the other pours forth into the gutter, the sewage. There are no chimneys and no sewer pipes. Our jinriksha men were Koreans. We had to guide them to the places we desired to see by showing them photographs or picture postal cards of the same. Japanese policemen either could not or would not try to direct them for us. They claimed to be unable to speak Korean, while a few of them were able to speak fair English. The regular guides were all engaged when we reached Seoul so we had to do our best without them. The American Consul and his assistant helped us out of our difficulty by explaining to the jinriksha men where we desired to go during our stay in the city and how they could understand our wants as we were on the way. This consul had been deposed because he was thought to be friendly toward the Koreans. The day we got to Seoul the baggage of the new consul had just reached the Consulate. This new man was evidently as unsatisfactory to

the Koreans as the one he succeeded was to the Japanese for he has since been killed by a Korean while on a return trip to the United States. The Consul we met informed us that the average Japanese of Korea are mere adventurers and carpetbaggers who are there for what they can make out of it. While the Koreans are a quiet and peaceful people when let alone the Japanese treat them unjustly and often cruelly disregard their rights. He was kept constantly in a broil settling disputes that could not possibly have arisen had there been the slightest intention on the part of the Japanese to do simple justice. He spoke highly of Prince Ito, and said that if Japan had sent men to Korea with anything like the moral nature of the prince no such troubles could have arisen.

Our route to Japan took us through the Straits where the Russian fleet was destroyed. We crossed on the new Japanese steamer, the Tshushima Maru, from Fusan to Shimonoseki. We had electric lights, electric heating appliances, European food, fine berths, and a beautiful dining-room on the ship. Officers and men were all Japanese. The one draw-back was rats. They practically played "tag" over our beds during the night, and waltzed through the dining-room during the day. The Buddhist stewards did not seem to dare, or to desire, to put an end to this nuisance. Between pediculi and rats we got a bad impression of the Japanese merchant marine and wondered if we could not in this discover the secret of the existence of plague, beri beri, and other oriental epidemic diseases, among these people. Aside from these they seemed to be a very cleanly people. Their houses are clean, they try to keep their persons clean In a park they will not, as a rule, sit down on a vacant bench until they have carefully cleaned it off and placed a blanket there on to sit upon. They seem never to travel without a blanket. On the trains they place it under them while they sit tailor-fashion on the seats. They all carry towels with which

they wipe all accumulations of dust and grime from their faces and hands. A most remarkable social feature of the country is constantly seen at the railway stations. The closets have two entrances, one being for males and the other for females, but on entering foreigners are astonished at finding no partitions and no line of demarcation for the sexes. Why they have two doors is incomprehensible.

Our first impression of Japan was very pleasing and was made more so by the plan the customs officers pursue in examining baggage. All examinations were made during the voyage so that when we reached land we were free to enjoy the scenery and study the people. What a blessing it would be for tourists if other countries adopted this plan. The scenery of the narrow entrance to the Inland Sea, where we found ourselves in the morning, is exceedingly beautiful. Its contemplation made me recall my early historical studies. Here lay before us the land that Columbus was sent forth to discover and annex to the throne of Spain, by virtue of the Pope's Bull. Here were the islands that Columbus thought he had missed by taking a too southerly direction. How fortunate for the world that he and Pinzon had the dispute that led him into the southerly course, otherwise North America would have been Hispaniolized and shared the fate that has befallen South America. He thought, on reaching land, that he had touched upon India instead of the "Zipang" that had tempted the cupidity of his Spanish backers. Khublai Kahn's story, to Marco Polo, about Zipang's palaces of solid gold was believed in implicitly by the courtiers of Ferdinand and Isabel. Without knowing it, Japan's fate, and the fate of the United States, hung together in the balance, as far back as 1492. That it should be our Commodore Perry who forced open the ports of Japan to foreign commerce, excited the commotion that led to the destruction of the feudal system in Japan, paved the way toward making it a country with a constitution and that finally lifted it

into the ranks of civilization, is a remarkable coincidence. The destiny that shapes our ends has tied us to the Philippine Islands by the humiliating of that power which sent Columbus across the seas to take control of

JAPANESE PHYSICIAN OF YE OLDEN TIME.

(Drawn about 1860, for Sir Rutherford Allcock's "Three Years in Japan.")

Zipang. Camorens, the Portuguese poet, in the Luciad, written in 1570, says:

> "Pass not unmarked the island in that sea,
> Where nature claims the most celebrity,
> Half hidden, stretching in a lengthened line,
> In front of China, *which its guide shall be*,
> Japan abounds in mines of silver fine
> And shall enlightened be by holy faith divine."

This wonderful prophecy is well on the way to fulfillment and shows that even at that early date there were those who could see

Japan's superiority and some of the chances of the future. Montgomery, many years later, wrote of both China and Japan as "Dead seas of men." That Japan was asleep and not dead time has proven. These were the thoughts that controlled my mind as we landed at Shimonoseki and stood facing the waters in which the awakened giant had submerged Russia's fleet and destroyed its dream of centuries. When we were fairly ashore we were startled by the news that the jingoes of America and of Japan were working for war between our own country and the country of the Mikado. As I thought of the $3,000,000 indemnity that we, voluntarily, returned to Japan, after their firing upon our ships in that very port, while England, France and Holland hung on to the last penny and never returned it, it occurred to me that surely that act would be remembered by both parties and present grievances settled in a somewhat similarly generous manner. When it occurred to me that the Mikado's generosity was stirred over the dastardly attempt of a citizen of this same port upon the life of the aged Chinese statesman Li Hung Chang, so that the former voluntarily, lessened the burden his officers were forcing upon China, it became evident that both our country and Japan meant to do the right thing by others at all times. Both had proven by their deeds that justice tempered with mercy was what they sought. As our train sped away from Moji station for Nagasaki I had settled down to the belief that there would be no war with Japan over the San Francisco muddle. The day was a delightful one and the passing scenery a duplicate of that of Java. Never were the hills and dales of two islands more nearly alike than are those of Kiusiu and Java. Tourists usually travel between these ports on ships so that they miss a treat of the most exquisite character. The beauty is beyond description. There are miles on miles of terraced hills, interspersed by lovely valleys, pretty villages, groves of giant camphor trees, smooth, clean roads with num-

erous evidences of growing civilization. Here is the region from which most of the vegetable wax comes and great numbers of the rhus bushes and small trees from whose berries it is produced were everywhere in evidence. Here we had our first introduction to one of Japan's quaint feasts, the Hatsu-nobori. Every house, in every village we passed, was celebrating the birthdays of their sons. Wherever there was a boy, over the house was hoisted a "koi" in his honor. If there were ten boys one or two tall flag poles were hung from the top downward with as many "nobori," or paper carp, as there were boys in the household. These carp are hollow so that as the wind blows through them they float out and swell up into the dimensions and shapes of true fish. Some of them were almost as large as diminutive whales and represented the fact that the boy was grown up. Others were small and stood for the baby boys of the family. They were of various colors and some were decorated with ribbons. It made a pretty sight. There is both taste and economy in thus celebrating the birthdays of all boys on the same days of the year. The girls, we were told, had a different set of days devoted to them. Theirs is in February.

At every station where we stopped our ears were greeted with the clack, clack, clack of the Japanese wooden sandal. Until we left Japan we never for a day got rid of that sound. Men and women both wear them. The feet are generally covered with a sort of mitten-like cover that gives them the appearance of a cloven hoof. The cleft is used as a means of holding to the sandal strap so that the wooden sandal shall not slip from the foot. The garments worn by all those in native costume give the heraldic mark of the old feudal clan to which they belong. The occupations of all kinds of workmen are likewise stamped upon their clothes. Marks of this kind are necessary in order to tell the respective ranks of people who are introduced to each other. The number of times they must bow, the depth to which they must

bow, the way they shall suck in their breath as an evidence of pleasure at the meeting, are all determined by the mark upon the clothes. It is amusing and interesting to watch this sort of ceremony and the opportunities for seeing it are innumerable. The Japanese are, probably, the most polite people on the face of the earth, and yet that politeness is governed, in its quality, by a definite social code to which all pay deference. One of the oddities in garment marks was that of the milk sellers. No heraldic sign and no oriental ideograph could meet this case, so as a substitute they print in script, on the back of the dealer, the English word "Milk." The ideograph is in general use all through Japan, Korea and China. Their books are printed in it. Each character is a symbol of an idea like our figures, our letter &, our dollar sign ($), our per cent sign (%), etc. So numerous are these signs that it takes years to master them. Once mastered and two men who cannot understand a single word that the other utters can read letters written by him and read the same books that he does, comprehending the meaning. A Chinaman can read the signs and bill-boards of Japan when he cannot understand a single word of Japanese. Let a German learn our dollar sign and on first coming to our country he could tell at a glance the meaning of $10, 10%, 4-6-1908. These are our ideographs. If they were written out as "ten dollars, ten per centum, July fourth, nineteen hundred and eight," he would be puzzled as regards their meaning. But the positions of the Japanese ideographs control, in some degree, their meaning. Take that of king or emperor, for instance. The ideograph we spell as "kyo," since this is the sound of it when pronounced. Next take that of town or city. The ideograph we spell as "to." By putting these together they get Kyoto or King's City, i.e., the city in which the Mikado, king, or emperor lives. When the "to" is to the right hand side of the "kyo" it means the eatsern capital or home of the king, while if to the left it means the

western city or capital. In this way they have the two capitals of Kyoto and Tokyo both spelled with the same two ideographs, but reversed in position.

On reaching Nagasaki we got fairly launched into an appreciation of the ways and habits of the average Jap. Here we had our first experience of their tea houses, of the free and easy manners with strangers of their waiter and geisha girls; of the tooting fife of the blind masseurs and shampooers; of the lacquered wooden temples; of the itinerant lunch-men; of the flower venders with their peerlessly beautiful flowers; of children scarcely able to walk bearing, the burthen of baby brothers or sisters on their backs; of newsboys advertising their wares with bells; of carpenters working their tools in the reverse direction that ours do; of that opprobrium of Japanese cities—the Yoshawara—where sin is legalized, young men go to select wives, and mothers to sell their daughters without a blush or sense of shame; of sacred enclosures full of doves, of sacred tanks full of turtles; of tame and sacred deer; of street quacks vending cure-alls and exhibiting their diplomas as evidence of fitness to practice on the crowd; of theatres, cheap shows and Coney Island exhibits as accompaniments to the sacred services in next-door temples; of sake stores vending not only the native drinks, but likewise selling our stronger brandies and whiskies, with—strange to say—no drunken men. But the characteristic sight of Nagasaki is the living chain of Japanese women loading coal from barges upon the ocean steam-ships. Without pause or cessation basket after basket, filled with heavy coal, is passed along from woman to woman, for hours at a time, up from the barge's deck, far up to the deck of the ocean-liner and over into her hold, where Japanese men receive and distribute it. The rapidity of their movements in this kind of hard work, is almost incredible. For it they receive only a few cents per day. As Nagasaki has been longer occupied by Europeans than any other city of Japan it is, naturally, less char-

acteristic of the country. Even in the matter of progressiveness it lags behind such cities as Osaka, Tokio and Yokohama. Its buildings are not as fine, its stores are less beautiful and less completely stocked, and its hotels do not reach the perfection of accommodation. On leaving it our route led us through the celebrated Inland Sea. The sail

BLIND JAPANESE MASSEUR.

here was delightful and the scenery though not startling was soothing and exceedingly pleasing. It was,

> 'Like mountain lake, so smooth and calm,
> The earth seemed hushed in dreamy sleep,
> As perfume breathed from isles of balm."

After seeing Kobe and Osaka we proceeded by steamship to Yokohama. On our way up the coast we secured our first view of that peerless, and unique sacred mountain, Fuji. We call it Fujiyama but that only means Fuji mountain. Its conical form, being alone, can be seen for many miles in all directions.

On this account it dominates the scenery of a very large part of Japan. Knowing that there is no other mountain on earth just like it the Japanese are very proud of it and their artists seldom forget to embody it in all the characteristically Japanese pictures which they produce. It is an extinct volcano and has an altitude of 12,390 feet. Two weeks after landing at Yokohoma we retraced our course, overland, to within six miles of Osaka and then we had many fine views of this superb object from all sides except the north. During this trip we visited Nara, Kyoto, Lake Biwa, Nagoya, Shizuoka, Gotemba, Odawara, Miyanoshita, Lake Hakone, Kamakura, and Enoshima. These are the principal points of interest for tourists in that part of Japan. North of Yokohama our route was to Tokyo, Nikko, and Lake Chuzenji. To adequately describe what was seen in each of these places would fill a small volume.

Nikko is the one place in all of Japan that the Japanese boast most about. They warn tourists not to say "kikko," i. e., beautiful, until after seeing Nikko. There is to be found the most beautiful of their temples. There nature was in her most extravagant mood when she constructed her numerous pretty cataracts. There vegetation is in a riot of effort trying to paint a landscape of unequalled splendor of color. Rhododendrons and azalas, wistarias and deutzias, magnolias and honeysuckles, columbines and epilobiums, clematis and roses, struggle with each other for pre-eminence of position and gorgeousness of display. They are scattered everywhere on hillsides and road-sides in wild profusion. Far up the tall and stately cryptomaria trees the wistarias climb to hang in solid masses of royal purple festoons from their symmetric branches. Every hillside was fairly ablaze with azalias of many colors. Some were snow white, some orange, some crimson, some scarlet, some pink and some well-nigh purple. In the gardens of the villagers the celebrated Japanese cherries were a sight that it was worth a trip of many miles to see. There is nothing comparable

to it in our country. The flowers of their cherry trees are very much larger than ours and their profusion is as great as is ours, so that every tree is one immense blaze of splendor. Every step of the way between Nikko and Lake Chuzenji is one series of gorgeous surprises. From the sacred crimson bridge, that only the Mikado is allowed to cross, to the Lakeside Hotel, is a continuous panorama of loveliness that in its wilder aspects strongly reminds the tourists who have seen Switzerland, of the superb Visp. It only lacks the peeps at the Matterhorn to complete the illusion. But the profusion of beautiful waterfalls outrivals the Swiss pass. Whittier must have seen some such spot when he wrote of.

"Where the splintered points of the crags were seen,
With water howling and vexed between."

But the cryptomarias. Where, on all the earth, is there anything comparable to the Tokaido road when lined with these? For twenty miles their arrow-straight trunks and cone-shaped forms line the road from Utsunomiya to Nikko. At Lake Hakone there are many more miles of these beautiful trees. They resemble very much our Caliornia redwoods. The monasteries and temples of Nikko are buried in them. They line the long flights of steps that lead up to these. The sacred buildings were, to me, far less impressive than the environment that nature had thrown around them. None of them are massive, awe-inspiring, or examples of beautiful architecture, like the cathedrals of Europe. They are all low buildings and their chief boast is the fine polished and lacquered wood-work of their interiors. Having seen one or two the tourist soon wearies of the effort of climbing up these steep steps that lead to them. In Tokyo, Kyoto, Nara, and Kamakura there are things of historical or other interest connected with their monasteries and temples that tempt one to visit these even when surfeited with views of the buildings themselves. We may only wish to discover in which one the devotees pay most attention to the Nio, or two Deva Kings,

that guard their entrances. It is only in Japan that people can be found who think they may be cured of a disease, have good fortune in business, win a lover or secure salvation by making a target of a god with masticated prayers. They buy the prayers from the priests or write them themselves. They are written or printed on small pieces of paper and ask for the thing desired. The worshipper chews the paper prayer, until he thinks it is just soft enough to stick well, and then he throws it at the face of the god, or, if the prayer calls for relief from some pain, at that part of the god's anatomy corresponding to the location of the pain. If it sticks his prayer is to be answered. If it does not stick he must try some other god who may feel more kindly disposed towards him. Some of these gods are bespattered with such pellets to such an extent that their hideous forms are rendered still more hideous by the scars and marks of the adhering pulp. Faith in the Nio does not, however, seem to be as deep seated, so far as medical treatment goes, as it is in Binzura. To study this phase of Japanese character at its best one must visit the temple of Kwannon at either Tokio or at Kioto. In either place one could spend days, without cessation of interest, watching the devotees.

Sir Frederick Treves, in his "Other Side of the Lantern," tells us that Binzuru "is a deity 'with a past,' and certain slight failings in his early days have brought him in closer touch with the sympathies of the people. He now busies himself with the healing of the sick." Binzuru was one of Buddha's sixteen apostles who for violating his vow of chastity was expelled from his exalted position. Buddha, probably taking pity on him, is believed to have conferred upon him the power of healing all human ills. His image is therefore placed outside the sanctum so that it is always within reach of the faithful. From morning till night they crowd around it muttering prayers, rubbing with their hands that part of it which represents the seat of their own affliction and then

rubbing the latter. In whatever temple one happens to see him they will always discover that he is rubbed out of shape or resemblance to a perfect human form. The surface of his body is polished with human hands and around his neck, on his hands, or on his head his sympathetic worshippers have placed colored bibs, fancy hoods, or pretty gloves or mittens. No other god in the temple receives such marks of affection or of care. Dr. Treves, after his inspection of the one at Kyoto, had this to say about it: "thousands of hopeful hands have rubbed all the lacquer from his brow, have lowered the height of the forehead, and have rubbed away his nose. From this it is to be inferred that headache and cold in the nose are common in Japan. Binzuru has also been worn to the wood in the region of the stomach as well as over the great toe, which losses of structure suggest that indigestion and possibly gout are not unknown about Kyoto." The doctor then goes on to tell of seeing a woman come and rub the head of a boy having ring-worm of the scalp and then rub the head of Binzuru to get it cured. Immediately following her was another woman with a mentally defective child whose head she rubbed following with the rubbing of the head of the god, and repeating with successive rubbings of each. He says: "Whether in the course of days a brighter intelligence dawned in the lad's dull eyes I know not; but I have little doubt that in its appointed time ring-worm appeared upon his scalp." For centuries this way of scattering disease has been going on and in spite of modern enlightenment it still persists with unabated ardor. Who can say to what extent the spread of cholera, of the bubonic plague, of beri beri, and of other equally dangerous maladies, is due to this method of disseminating pathogenic micro-organisms? When it is a notorious fact that the holy water, in our American churches, is impregnated with bacillus coli communis, in less than an hour after being freshly placed, why should not the polluted hands of the patrons of Binzurn

THE NAVAL HOSPITAL OF U.S.A. IN YOKOHAMA

thus transfer from hand to hand the germs of dangerous diseases? To go home and prepare food, after the rubbing of the head or body of the god, is to sow the seeds that multiply into a million fold the transferred few. Nor is the habit dangerous alone to themselves. It is the worshippers at the temples of Kwannon who pick the tea, prepare the rice, polish the coffee beans, and do other work upon goods that are exported to the ends of the earth. It is these same worshipers who scatter themselves abroad through civilized countries to do the work of laborers. Talk as we may about the virtue of tolerance for ancient religions, but the fact remains that it is the ignorant clinging to what ought to be defunct faiths that is the greatest hinderance to scientific hygiene. Moslem ablutions and Moslem herdings together during hegiras Buddhistic and Brahministic opposition to the destruction of rats and fleas, holy ablutions, sprinklings and rubbings of polluted objects or polluted water, and the passing of polluted cups from lips to lips, constitute the most threateningly dangerous acts of human conduct. In self-defense the civilized people of the earth may be compelled to use force to put an end to all such so-called sacraments or so modify them that they will cease to be dangerous to others. The one remarkable feature of all these dangerous religious habits is that they were originally devised for a purpose the very opposite to that to which they have led. Their original aim, so far as can be inferred, was one of cleanliness or of purification. It is due to the loss of all meaning and the acceptance of them as decrees of the gods that pollution through them has become possible. To put a spiritual meaning into an act of any kind at once carries it out of the region of common sense and tends to debase it. The Japanese are much less likely to acquire habits of uncleanliness in this way than are the Hindoos. Their basic faith is Shintoism and its essence is obedience to the law and physical cleanliness of the body and of the home. While most of them may accept the Buddhist

faith none of them ever ignore their Shinto education.

But for that spirit of implicit reliance of the people upon the Mikado, and those in power, Japanese progress in civilization would have been very much lower than it has been. The first duty of every Jap is loyalty to his country and its sovereign. It was this training that made him so faithful a soldier in the recent Russian war. It is this that is directing them into our ways of education. His leaders have seen the light and his Shinto training, from the cradle up, has been obedience to his superiors who represent his country. Because of this a Japanese Board of Health can go to greater extremes in enforcing sanitary regluations than an American board dares to do. It is no uncommon thing for them to burn down Japanese homes so as to suppress a contagious disease. Why they do not turn their attention to Binzuru and get rid of him is probably because of his vital connection with Buddhist faith. It would strike too deeply into the heart of popular superstition and might alienate many from their Shinto training. But, judging from the way the country is moving ahead, it is not likely to be long before even this superstition will be attacked and suppressed. Their quacks are becoming fewer in numbers, their priests are being trained in modern ways, their old-style doctor is a thing of the past, and the educated medical man is already in the ascendancy. Doctors who disregard the laws concerning contagious diseases are dealt with severely. Their right to practice is withdrawn from them for from one month to one year. There are in the neighborhood of 35,000 properly qualified medical men practicing in Japan. This gives one well euducated doctor to about 1300 inhabitants, for the entire country. In the cities the proportion of doctors is larger. Their medical colleges are planned after the best models in Europe and America. Their first professors in these and in the universities, were composed of picked Japanese educated abroad, and foreign pro-

fessors imported for the purpose of securing their skilled guidance. Now there are but few foreign professors as they have an abundance of capable men of their own race to conduct these institutions. When the experiment of educating the Japanese people in occidental knowledge began the leaders sent, through their foreign envoys, requests for advice to the chief educators of the world. The Japanese envoy at Washington, in 1873, received in this way letters of advice from such men as Presidents McCosh, Stearns, Woolsey, Hopkins and Elliot. Prince Ito, then a young man and enthusiastic in such work, frequently consulted Herbert Spencer for advice. In bacteriology Koch was their guide and Kitasato, then a student with von Behring, was their rising star. Later in his career Kitasato made his mark for all time by his work on antitoxin. To him, Behring and Roux the world owes a debt of gratitude that it can never fully repay. It was likewise Kitasato who, in 1889, isolated the bacillus of tetanus and in conjunction with his fellow-countryman, Yersin, in 1894, isolated that of plague. We here see that Japanese men of science began very early to pay back to civilization part of the debt it owes. Many such cases can already be cited, but there is one of particular interest to the medical men of the United States. Dr. Jokichi Takamine, now of New York City, but formerly of Tokyo, was the first to isolate diastase, in commercial amounts, from a Japanese fungus and the first to isolate adrenalin from the extract of the suprarenal glands. He is quite well known to a large number of the medical men of our country. The story of the additions to human knowledge made by their botanists, zoologists, physicists, and other would be an interesting one to give, but it would make this letter too long.

DR. R. G. ECCLES AND WIFE

In Moorish costume, in the Alhambra, Spain

Touring the Lands Where Medical Science Evolved

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BROOKLYN, N. Y.

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TOURING THE LANDS WHERE MEDICAL SCIENCE EVOLVED.

GRECIAN.

We began our first letter to the Medical Fortnightly in Turkey and ended our last one in Yokohama. The trip across the Pacific Ocean and through the United States, being of little interest to readers, is purposely excluded, Our tour, of course, began at Brooklyn and ended at the same place, but the voyage across the Atlantic, interesting as it could be made, must be excised from our story for the purpose of making room for still more interesting matter. Our ship to Europe was called the "Barbarossa," and this name gave me the cue to considerable information that directed our course, and it has likewise led to the writing of this and the two succeeding supplementary letters.

The chronological necessities of following the evolution of medicine make it necessary for our present description to begin in far off Catania. This city will be found at the foot of Mount Etna, in Sicily. An Italian ship on which we were sailing had to put in here for three days to escape the "Euroky-lon" of the Acts of the Apostles. The English, at Malta, call it a "gregale." St. Paul was wrecked by this form of tempest. Ulysses, from whom Grant was named, met a like fate here. The day before the tempest began our ship, the Bormidia, had steered past the fabled Scylla and Charybides taken us on board within sight of these danger points,

at Messina, and was on its way to Athen. We had just reached Messina from Syracuse and had wandered through the street in which Archimedes ran while crying out "Eureka," and where the sterling honor and true friendship of Damon and Pythias had been tested by Dionysius. We had seen, heard, and verified the power of that wonderful echoing grotto'—the Ear of Dionysius—that Archimides is credited with having constructed, while speculating upon how to move the world with lever and fulcrum of sufficient size. There is probably no where else on earth an echo-chamber capable of so perfectly reproducing whispers as audible sounds. To the medical man, as such, the tyrant Dionysius is the central figure of the place in that he was among the first to desecrate the sacred grove of Esculapius. Not daring to allow his impiety to carry him to the extent of removing the entire gold and ivory image of the god from Epidaurus to Syracuse he instructed his soldiers to cut off the beard of precious metal and take that. He justified this act by saying that as Apollo, the father of Esculapius, had no beard it was unbecoming in the son to wear such an appendage. Being on our way to Epidaurus we have begun this recital at Catania, that was then within the dominion of Syracuse, and that the tempest had forced us to visit a third time. We had been there twice before. Our first stopping place, after leaving Sicily, was Candia or Crete. We spent half a day in the city of Caneé studying the motley crowds of Turks, Greeks, Latins, Arabs and Africans. The island is almost exactly midway between Europe, Asia and Africa and was one of the earliest nuclei from which civilization radiated. Long before the time of Greek medicine Crete had absorbed that of Phrygia, Egypt, and Phoenecia and sent it to Greece. Those who play the game of checkers may be interested in learning that the oldest checkerboard found in the world was dug up from Cretan ruins. Egyptian objects bearing dates of 1500 B. C., have been unearthed at Crete. The earliest evidence of the use of carefully

squared stones in building, of colored frescoes and plastic decorations on walls, of sculptured marble, and of brightly decorated pottery comes from Crete. It took our steamship about eighteen hours to take us from Canee to the Pyreus, the latter being the port of Athens.

We reached Athens at about 1 p. m. and scarcely had we found a room in the Hotel d'Angleterre than we secured a guide and sallied forth to stand on Mars' Hill and the site of the Acropolis. The dream of a life time was about to be realized in fact. For nearly half a cenutry had we longed to stand there, but this was the first time we had been able to go and enjoy it. Lord Byron echoes our feelings when he says:

> "Where'er we tread 'tis haunted holy ground;
> No earth of thine is lost in vulgar mould,
> But one vast realm of wonder spreads around
> And all the muses tales seem truly told,
> Till the sense aches with gazing to behold
> The scenes our earliest dreams have dwelt upon."

It would be impossible to put into words the feelings and thoughts that welled into consciousness as we stood where Paul, where Alexander, where Socrates, where Plato, where Aristotle, and where multitudes of others of the world's greatest intellects of antiquity had stood and addressed the multitude. As we gazed on the ruins we impulsively repeated:

> "Look at this spot, a nation's sepulchre!
> Abode of gods whose shrines no longer burn."

Facing us, on the hill beyond, and facing Paul as he cried out, "Ye men of Athens," is the dismal cave-cell where Socrates drank the hemlock in obedience to the decree of his judges, 399 years before the birth of Christ. He had been found guilty of impiety and of blaspheming these gods "whose shrines no longer burn." He had to die as a penalty because he dared to see truths the multitude failed to see. One of these truths was, "The proper study of mankind is man." Thus stated it put a new shade of meaning on what might be called a statement of their scriptures. After taking the poison his last words were: "Crito, I owe a cock to Esculapius;

will you remember to pay the debt?" Crito replied: "The debt shall be paid." His dying thought was the debt he owed for medical services. How many of our patients, in these Christian days, would be as thoughtful of their doctor's bills when facing dissolution? His ethical system, which he daily tried to inculcate into the Athenian mind, was condensed into the two aphorisms, that "Vice is ignorance," and that "Virtue is knowledge." He held that if one fully knew the consequences to themselves and to others of the acts they do evil would be at an end. The great Plato, his friend and student, con-

Theatre of Esculapius at Epidaurus.

tinued to teach the same principles for years after, but while Socrates was sacrificed to the bigotry of religion Plato was permitted to live to a ripe old age. During the many years of his life he was a diligent student and a voluminous writer. His works on philosophy, medicine, and physiology have profoundly affected the science of our day. As a philosopher he paved the way for Berkeley and the idealists. As a physician he caused Aristotle, his pupil, to become a pioneer thinker and so to clear away the rubbish that time always heaps up. In opening up the new field Aristotle, necessarily, had to break away from the intuition doctrine of his master. He discovered that solid knowledge results from investigation and experiment. He gave us our first comparative anat-

omy and physiology, through dissecting of animals. His pupil, Alexander the Great, at a later date gave us Alexandria with its medical college and great library, much of which was medical. The intellectual progeny of Socrates thus brought so much of good to the world that, with Charles Mackay, we can say:

"Pace in thy cell old Socrates, merrily to and fro,
Trust to the impulse of thy soul and let the poison flow.
But yet the world goes round and round, and the genial seasons run
And ever the wrong is proved to be wrong, and ever is justice done."

Our stay in Athens was one round of delightful sight-seeing both among the ruins and in the new city. But to see Athens is not to see Greece, so after proper arrangments with our hotel courier we were again quickly on the wing. From the Pyreus we took ship for Itea and were soon sailing in the very waters where the fleet of Xerxes was put to rout, the Persian princes destroyed, and European civilization saved in its budding infancy from being swamped by the barbarous hordes of Asia. Here is Salamis and yonder Mount Aegalis, where Xerxes sat on his silver footed throne and helplessly watched his armada of 1000 ships compelled to flee before 400 of those of Greece. With nearly one million soldiers around him he was tied to the shore in helpless despair. "All is at stake" was the watchword of the Greeks, but even they did not know that all of civilization was at stake and in their keeping. Aeschylus, the Persian poet, justly declared that "In Salamis the power of the Persians lies buried." After passing Salamis we were soon down deep in the gorge of the great Corinthian canal and looking high up at its banks, a small reminder of our greater work at Panama. Our steamer the Pylaroze, almost filled the channel from bank to bank, as high above our heads a railway train rolled over on the suspended bridge. As soon as we had cleared the canal we were in the Gulf of Lepanto with our bow pointed in the direction of the Bay of Salona. As we neared this the sun was setting in the golden west and soon a crimson glow covered

the sky, through which appeared the pretty crescent of the new moon. Not a cloud nor semblance of a fog could be seen anywhere. Overtowering the scene to the right, and forward of the ship, was the snow-capped peak of Parnassus. Could mortal be other than enthused at such a sight. Here in majestic beauty, framed in crimson, gold, and blue, capped by a diadem of purest white, stood that home of the Muses that had for ages been extolled by authors, raved about by poets, and symbolically depicted by artists. Abridging Childe Harold we get this picture:

"Oh thou Parnassus! whom I now survey
In the wild pomp of mountain majesty!
Oft have I dreamed of thee! whose glorious name
Who knows not, knows not man's divinest lore!
When I recount thy worshippers of yore
I tremble, and can only bend the knee;
Nor raise my voice, nor vainly dare to soar,
But gaze beneath thy awful canopy
In silent joy to think—at last I look on thee!"

We landed at Itea at dusk and found a carriage in waiting to take us nearly 2000 feet up the mountain to the hotel at Delphi. As we were the guests of the Hotel d'Angleterre of Athens, during our entire tour, they telegraphed ahead of us to every point and arranged for our comfort. A climb of nearly two hours, through canyons, along chasms, and among the wildest of mountain scenery, which it was too dark for us then to see, brought us to a warm supper, comfortable bed, and charcoal braziers. There are no fires or fireplaces in Grecee. Everywhere we had to warm ourselves over a little mass of glowing charcoal in a brazier. Next morning we made an early start to visit what was once the most famed spot upon our planet, where empires had their destinies proclaimed, where kings trembled at the words of the oracles, where the stream of human progress was directed by a whim, and where went forth decrees that we, today, are still enthralled by, without being conscious of the fact. From here too the rill of early medical lore started on its course to that mighty stream which is now biological science. Making our way through the crumbling ruins of

shrines and statues, priestly homes and treasuries, sculptured blocks and the earthquake rent shreds of the rocks of Parnassus, we were at last able to mount that priceless archeological treasure, the tripod stone of the Sybil. The carved marks of where the legs of the gold tripod rested are clearly discernible on its surface. Before it lies the wreckage of the mighty temple, near the centre of which is the supposed crevice, the vapors from which brought the sought for inspiration. The numerous treasuries attest the religious and political strength of the priests. In the Sermon on the Mount we are told that "Where our treasure is there will our heart be also." The gold, the precious stones, the spoils of war, the richest treasures of art were gathered here. When fragmentary Greece was a tempting prey to the barbarian hordes of Asia the Amphictyony of Delphi was their tower of strength. This federal centre, like our Congress and Senate, gradually linked the helpless little States together, impressing upon them the value of *voluntary union.* Step by step out of this grew our great modern republics. The priests of Delphi are believed to have come originally from Crete and, as already stated, the Cretans traced their inspiration to Phrygia. As every American should know the Phrygians were the world's original freemen. Our Goddess of Liberty still wears the Phrygian cap—the cap of liberty. That old spark of freedom, from unknown depths in prehistoric time welled up again in the Delphic Amphictyony. The accumulated wealth of centuries that was gathered here and at Olympia came, in time, to be a tempting bait to cupidity and when, at about the time that Christ was born, faith in Apollo weakened, the Delphic priests lost their grip upon the masses and thus gave Sulla, Nero, and finally Constantine an opportunity to come and rob them. Before that even the emperors, and other rulers of Rome, were glad enough to turn the ear of faith toward the utterances of the Delphic oracle. During the great pestilence of B. C. 291 an expedition

was sent from Rome to Delphi. Ovid says:

"In vain were human remedies applied.
Wearied with death they seek celestial aid,
And visit Phoebus in his Delphic shade."

By this time, however, an evolution had taken place. Apollo, the god of health, had relinquished the healing art to his son, Esculapius. The Delphic priests, having assumed the higher function of healing the ailments of States, gave up, in part, that of healing men. In ancient times the priests were the physicians, but then as now an overwhelming pressure of work compelled a division of labor. The oracle, therefore, replied to the Roman embassy:

"Relief must be implored and succor won
Not from Apollo, but Apollo's son.
My son to Latium borne shall bring redress;
Go with good omens and expect success."
—Welsted's Ovid.

Some idea of the great antiquity of the Delphic oracle can be had from the fact that 900 years before the birth of Christ Iphitos of Elis and Lykourgos of Sparta consulted them regarding how best to benefit the manhood of Greece, and were told to go to the Olympian plains and start the health-bestowing games that have since ramified the whole earth. So to them, in a measure, we owe the very beginnings of hygiene and preventive medicine. In the vestibule of the temple were engraved the best mottoes of the seven sages and in conspicuous places were placed "Moderation in All Things" and "Know Thyself." Back toward the mythical period Croesus (about 600 B. C.) consulted the oracle, not too wisely, and is said to have received from Apollo the gift he most craved—the power of converting everything he touched into gold. It proved to be a fatal gift for him.

A few yards from the temple is a cleft in the mountain, from which flows the Castalean Fountain—the original holy water and baptismal font. Before entering the temple every pilgrim had to sprinkle his face and body with this water. Ovid describes this sacrament in these words:

"To the pure precinct of Apollo's portal
Come, pure in heart, and touch the lustral wave;
One drop sufficeth for the sinless mortal;
All else, e'en ocean's billows cannot lave."

In the museum we saw the original Omphalos—a stone in the shape of half of an egg, that originaly marked the centre of the temple and what was claimed to be "the navel of the earth." Boston speaks of itself as "the hub," but the ancient Delphians called theirs "the navel." Tradition says that Apollo sent forth two eagles to circle the earth. Both were started simultaneously and both reached the Omphalos at the

Temple of Health at Bassae (2300 years old).

same instant, although flying with the same speed. There is a suggestiveness of a round earth in this, and the Omphalos slightly corroborates this suggestion. The carvings on its surface are wonderfully like little globes with lines of latitude and longitude upon them. The place this stone occupied tradition likewise declares was the original spot where Apollo, when but a few days old, slew the python or dragon that was devastating that part of the world. He was thus represented as the first destroyer of the great type of human evil and danger. His son, Esculapius, had the subdued serpent as a representative of his power to conquer disease—the product of the serpent. The Old Serpent being slain the younger progeny were at his mercy in defiance of their venom. On the Halos,

or thrashing floor, near the temple, a festival was held every seven years to commemorate this destruction of the serpent. Much has been said about the humbuggery practiced upon the public by the Delphic priests. It is said that they had secret emissaries in every court and agents in every place where pilgrims came from to visit the temple, and that through these they gained, in advance, the knowledge which they needed in constructing their replies. While to a superficial thinker this would probably prove duplicity, to one who goes deeper into the subject and understands human nature well it would be evidence of sincerity. An institution of that kind could not have lasted for so many centuries and won such favor in the eyes of the world if the priests had been mere charlatans. They must have been as sincere as were the worshippers, or as are the preachers of today. Interpreting nature in a natural manner inspiration was deemed natural. They saw it as only coming after they had exhausted the powers the gods gave them to get truth. We do not think of accusing a Christian neighbor of hypocrisy, because he prays: "Give us this day our daily bread," and then proceeds to work for it. The principles are identical.

Having seen Delphi we proceeded to Patras. Nearing the latter place we were in the region of many historical crises and romances. Before us lay the islands of Ithaca and Santa Maura. The first named was the home of faithful Penelope, and on the shores washed by the waves of these waters she daily stood for ten long years watching for the return of her soldier husband, Ulysses. On the second, the Leucadian Rock faced our ship, and from its summit love-sick Sappho, the world's greatest woman poet, hurled herself into these waves, 600 years before the Christian Era. To our right, and washed by the waves of our propellor, lies Missolonglin where England's great Byron breathed his last. Of Sappho he said: "Could she not live who life eternal gave?" We can only repeat the same sentiment of him. In mockery of

Penelope's faithfulness to a husband, these same waters saw the wanton, Cleopatra, take fright, order her gallies to fly and leave Marc Antony to suffer defeat. Coming still nearer our own day, and in this very sea, Don John's Holy Armada, composed of ships from every part of Europe, faced and put to flight Turkey's threatening power. What Xerxes was to Greece, at Salamis, Ali Pasha was to all Europe at Lepanto. This began the end of that power that threatened to Mohammedanize the earth and that is now only represented by the so-called "sick man" of Europe. Patras is chiefly interesting to tourists as the place where the patron saint of Scotland—St. Andrew—was crucified on an X-shaped cross. From there our route lay southward to famous Olympia. For more than 1000 years this place had been famous for its games. The Greeks reckoned time by these games, as we do by the birth of Christ. They occurred every four years, this being called an Olympiad. While the games were on no war could occur between Greek States, as then the truce of the "Ekecheiria" or "hand-staying" pledge; "The peace of God" was on the people. Only free-born Greeks of unsullied character were permitted to take part in any of the games. There was foot racing, horse racing, chariot racing, javelin throwing, quoit throwing, disc throwing, wrestling, boxing. Great orators came here to speak to the people. Kings and emperors made it their holiday rendezvous. Plato, Pythagoras, Herodotus, and many other great men, were here received with honor Victors in the games, their relatives, and families were recipients of the greatest distinction. A branch from an olive tree, said to have been planted by Hercules, was presented to each as the first token of universal favor. To be the possessor of such a branch was deemed more honorable than to be the owner of a crown. They were banqueted and feasted wherever they went, triumphal receptions followed their movements, and those receiving the highest distinction were exempted from taxtion and had their

statues carved in parian marble and placed near the gods. The grounds, for miles, were covered with costly treasure houses, shrines, temples and statues. The statue of Zeus was so fine that it was counted one of the Seven Wonders of the World. Lysias called Olympia "The fairest spot of Greece." As at Delphi the accumulated treasures were so great that a kingdom could have been bought with them. The best works of art of their best artists were found here and at Delphi. What is probably the best preserved of ancient statues—the Hermes of Praxiteles—was found here buried in the mud of the overflowing river. It is now in the museum on a nearby hill. It is declared to be the most valuable of all the discoveries made at Olympia. So perfectly was it protected that the sandal thongs still show the gilding and red coloring. It has been pronounced the most perfect expression of manly beauty that has reached us from antiquity. The caduceus is grasped by the left hand. This symbol is now used by the Public Health and Marine Hospital Service of the United States. The staff means authority, the wings celerity, and the conjugating serpents wisdom, knowledge and fecundity. Hermes was the same to the Greeks and Egyptians as Mercury was to the Romans, the winged messenger of the gods. He was worshipped as the patron god of merchants, travellers, news purveyors and seamen. Praxiteles, the sculptor of the Olympian Hermes, was one of the most celebrated artists of antiquity. He placed a number of statues both at Delphi and Olympia, but chose as his model of female beauty the courtesan Phryne, he being one among her many lovers. She sat for the celebrated Cynidian Aphrodite that Pliny declared was the most beautiful statue in the world. She likewise sat for Apelles' great painting of "Aphrodite Rising From the Sea." From poverty she rose to such wealth that when Alexander the Great destroyed the walls of Thebes she agreed to rebuild them if they would let her place over one of the gates, "Destroyed by

Alexander, Restored by Phryne the Courtesan." Like Socrates, she was accused of impiety and blaspheming the gods, but unlike Socrates, she won over her judges, by displaying her beauty, and escaped. Justice in ancient Greece was not much different from what it is today. After leaving Olympia we had the most fatiguing journey of our entire tour. We started at 4 a.m., for a two hours ride by train, after which we journeyed by horse till 11 p. m., over the wildest kind of mountain roads with, in places, not even a trail to be seen. The saddles were of the crudest pattern and the horses mere workers on mountain farms. Good horses and saddles had been telegraphed for and would have met us, but that a terrific thunder storm had made the fording of the rivers impossible by the usual route. Our mountain climb was made in order to get to the head waters of these swollen streams and the steeds were hired from the poverty-stricken farmers. We carried our provisions on pack animals, in regular Rocky Mountain fashion, and when we stopped to eat the natives gathered around to gaze at the extravagant living of the "lords" who could afford to eat meat, chicken, eggs, and pastry with white bread, while they could only afford rye bread, potatoes, a little salt, and a drink of water. Such, according to our guide, were the comments made. The only places where our horses could be persuaded or pounded into going faster than a walk was down a hill, and then the jolting was terrible. Behind us went the owners of the animals shouting at them, hour after hour, "Yaw! Yaw! Yawlow!" For days we could not get that cry out of our ears. When we reached Andhritsainae we put up at a private residence, the people of which had been looking for us two hours earlier. Next morning I asked my good wife what she now thought of Douglas Jerrold's statement, that the best thing for the inside of a man was the outside of a horse. Her reply was: "It may be all right for a man, but it certainly is not for a woman and, besides, medicine should never be given in such toxic doses." The

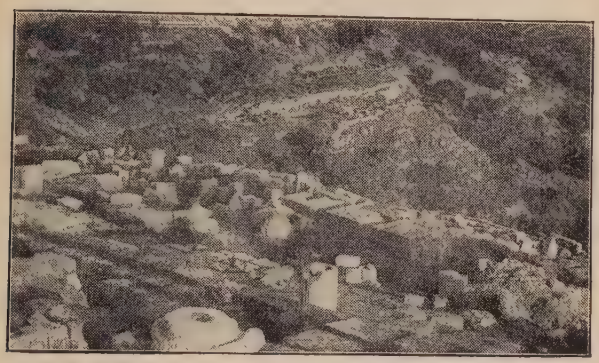
trip, had it been shorter, and, so, less fatiguing, would have been a delightful one. The scenery was magnificent. We had frequent peeps off into the Gulf of Arcadia and the Ionian Sea, with their many green islands. Our path was strewn with a wonderful wealth of beautiful wild flowers. We had to push our way through numerous groves of tall arbutus and made ourselves almost sick eating the delightful berries of this Grecian shrub. On the same bush hung great masses of ripe and therefore, bright crimson ones, with equally large masses of less ripe orange ones. Mixed among these were fragrant flowers of the purest white so that with the evergreen

Prison of Socrates, Athens

leaves they presented to our unaccustomed eyes a most striking and most wonderful combination of pretty colors. Toward night we were beset with mosquitoes, thus reminding us of a recent claim, that the fall of Greece, to its present low state, resulted from the malaria that these mosquitoes brought to this country. Next day our trip was again on horseback, but this time we had better horses and a shorter ride.

We had come into this part of the country to see one of the best preserved, very old temples in all of Greece. It stands on the top of a high mountain, far away from all civilization, and has stood there for over 2300 years. There never has been anything else there but itself. Toiling thousands of Greeks carried the marble and metal from distant regions and the limestone from far down the mountain, with which to build it.

It was a large and beautiful structure and its architect built the Parthenon at Athens. The fact of its being dedicated to the god of health, and that it was a thank-offering of the people of the region to that god for saving them from a plague that about 430 B. C. devastated Athens, makes it doubly interesting to the medical man. Pilgrims seeking for health had to climb into this airy, breezy region, on the top of this lonely mountain to get it. No doubt Apollo heard and favorably answered the prayers of many. After seeing this remarkable structure our next prospec-



The Gymnasium at Delphi.

tive point was the great temple of Esculapius at the sacred grove of Epidaurus. We were two days in getting there, a good part of the time being spent in a carriage, rolling through the far famed Arcadia. It is certainly a very pretty pastoral region, but we could see nothing more peaceful, more full of the bliss of simplicity, or in any way more attractive than in many another such spot in our own country. The strange costumes of the people appeared to be more worthy of remark than any other thing. The men looked for all the world like ballet-girls on a stage. Their short skirts, puffed out around the region immediately above the knees by a multiplicity of short petticoats, would have seemed extremely odd had women been the wearers. To be worn by men seemed the very acme of

absurdity to us. To see them carrying strings of beads and telling them off with their fingers made us think they were using them for prayers. We were told that most of the men of Greece use these beads merely to keep their fingers busy and to be fashionable.

Before reaching the Hieron, or sacred grove of Esculapius, we passed through Karytaena, Megalapolis, Tripolis, Boleta, the ruined city of Palantion, Argos, and Naupalia. The feudal castle of Karytaena is a wonderful sight, standing as it does, surrounded on three sides by a continuous precipice of over 1000 feet, and that is formed by the curve of the foaming waters of the Alpheois River. In plain sight, to the north, is Mount St. Elias where tradition says Rhea, the wife and sister of Chronos, gave birth to Zeus. Chronos is their god of time. Palantion is said to be the original home of Evander the first colonizer of what became our Eternal City—Rome. He left this place before the time of the Trojan war. On reaching the Hieron of Epidaurus we put up at the home of Panagiotis Vostetsanos, keeper of the museum. It faces the hill of Titthion on which the goats of Aresthanas gave milk to the new born god of medicine. To the right, on looking toward Titthion, is the best preserved ancient theatre in the world. Here multitudes were instructed in hygiene and entertained in various ways while waiting to be cured. It is a most remarkable structure to be found in such a place. No city was ever nearer it than the seaport of Epidaurus, six miles away. Where then did the people come from to make such a theatre needed, with its seating capacity of 30,000? Besides this there was a large gymnasium that would seat well nigh 1000. In the front of the temple was the altar and in the interior stood the costly statue of the god that was composed of gold and ivory. Near the temple was the Katagogion, or hospital, 480 feet on each of its four sides. Small rooms were provided for each patient along the sides. At the rear was a corridor ex-

tending along the rears of all the rooms. Within this corridor-square were four small squares of rooms centered by four courts. This economical arrangement of the space gave a capacity of over 160 patients with each room and bath to himself, and that without stair climbing or absence of air. There were other large buildings that were probably used as dormitories for the convalescing, or those with minor ailments. A building immediately adjoining the gymnasium is believed to have been the dwelling place of the priest-physicians. Bathing houses and bathing places were numerous and one large marble bath tub we saw was about the shape of our modern ones. On the temple grounds is a holy well 54 feet deep while numerous surface and subterranean water conduits direct the streams from the surrounding hills in the direction of the Hieron. There were hot baths, cold baths, Turkish baths, and friction baths. The patients had to use dumb-bells and undergo gymnastic exercises. The "incubation" cure occurred within the temple by the patient sleeping there in a condition of discomfort that led to dreaming. The dream was interpreted by the priest and was supposed to direct to the required treatment. The chief medicines administered were salts, honey, and an abundance of water from the holy well. Patients left inscribed slabs giving thanks to the god for their recovery. The Grove of Esculapius was filled with the rich votive offerings they left as recompence. At the Tholos sacrifices of animals occurred. The meat was consumed by priests and patients and the entrails burnt as a sacrifice to the god.

From the Hieron of Epidaurus we made our way back to Athens, stopping long enough, enroute, to see the wonders of Tiryns, Mycene, and Corinth. From Athens we proceeded to Smyrna, saw considerable of Turkey and returned to Smyrna again. From there we visited a number of places that we will consider in our next letter. One of these places was Vathy on the Island of Sa-

mos. The ancient city of Samos lay just over the mountain. Here Pythagoros was born. This father of medicine, unlike the Asclepiades, or Priests of Esculapius, visited patients at their homes and taught his disciples to do the same. He studied in Egypt and India, so got his lore directly from the oldest peoples. His system of philosophy profoundly impressed the world. It was based chiefly on the properties of numbers. He represented the spirit of all being by the figure 1, matter with its attendant motion by 2. The universe (1, i.e., God) be placed before matter (2) thus gives us 12. Since 12 is 3 multiplied by 4 he had 3 worlds—upper, middle, and lower, surrounded by 4 spheres. Since 13 is 1 before 3 it introduces the evil principle into the universe, with sin, disease and crime, and is therefore unlucky. The four spheres were represented by fire, air, earth, and water. As his doctrine was one of pure abstraction he meant the fire principle which we call energy, the air principle which we designate as gas, the earth principle which we designate as substance, and the water principle which we call liquidity. He held that no one could be in health unless his temperature, his breathing, his tissues and his circulating fluids bore a definite mathematical relationship to each other. They had to be Harmonic, i.e., have a perfectly balanced rhythm with the figure 12 and not with 13. As 3 plus 4 is 7, this last number was deemed a sacred one, and so we now have as a relic of Pythagoras' teachings 7 days in the week, 7 years of plenty, 7 stars, and a host of other 7's. To him we owe the universe-standards of 12 months to the year, 12 signs to the zodiac, 12 lines to the inch, 12 inches to the foot, etc. Our year he gave us as 365 days and a quarter. Every circle he made 12 times 30 degrees thus combining decimals with duodecimals. The year is 360 plus 5.25 days. The sum of 5,2 and 5 is 12, thus again giving decimals and duodecimals. He believed sincerely in the doctrine that God geometrizes.

On our way from Samos we passed in sight

of Cos, but did not stop. Here Hippocrates was born, and here he acted as a priest-physician in the temple of Esculapius. From Epidaurus a number of branch institutions were started, chief among which were Pargamos and Cos. We got a peep at Pargamos on our way from Constantinople to Smyrna. We were now getting a peep at Cos on our way to Beirut. A narrow channel had to be passed here that permits of the seeing of Cos on one side and Halicarnassus on the other. The latter was the site of one of the seven wonders of the ancient world. Hippocrates was the contemporary of Socrates. He claimed descent from Esculapius. Like Plato and Pythagoras he was a voluminous writer. What is probably one of the first medical schools in the world was started at Cos by Hippocrates. The Hippocratic oath was first given here. With Pythagoras he held that health depended upon the exact proportions and play of elements in the body. He first taught the doctrine of crises or turning periods to disease. He classified treatment and diseases as medical and surgical. He made prognosis a leading feature of his practice and followed the methods already given in describing the Hieron at Epidaurus. The people of Cos show travellers a tree that is supposed to have been planted by Hippocrates, and point out the ancient aqueducts, from the fountain of Burima, on the side of Mount Prion, as being remnants of the Esculapian waterworks for the temple.

CHRISTIAN AND SARACEN.

In my last letter Pergamos and Cos were referred to as places where the doctrines of Esculapius had taken deep root. In this communication it is necessary, for the proper understanding of our subject, to once more recall them and emphasize the fact that we have here not medical men to deal with, in the modern sense, but a religious body. At the time these two places were at their best Esculapianism was the religious cult of the people and the curing of the sick was then held to be evidence of the real divinity of Esculapius. The priests were believed to bring to the sufferers the relief they sought through the miraculous power given them by the god which they represented. The evolution of medicine, then, as a science, chiefly depended upon the mental development of the religious priesthood to a point where they were able to take the advantage of physical forces in bringing about their cures. As long as there was little or no religious rivalry there could be little or no stimulation to excel in curing power. At the beginning of our era such rivalry arose and our last communication left the reader at the point of early contact between the contending creeds. Upon each devolved the necessity of proving the influence they had upon nature as given to them by supernatural agencies. We have already seen how, under Hippocrates, the Asclepiades were verging toward a scientific system. Five hundred years after his appearance a new stimulus arose and met his disciples face to face in both Cos and Pergamos.

We learn from the Acts of the Apostles that St. Paul preached in Cos and in Samos.

He had likewise churches established in Ephesus and Smyrna. The last named place is less than fifty miles from Pergamos. About an hour after our ship left Samos, on our way to Cos, we came in sight of an island the name of which must be quite familiar to all readers of the MEDICAL FORTNIGHTLY. That island is Patmos, where St. John wrote the book of Revelations. He was a prisoner there when he wrote it and his opposition to the Greek and Roman gods, of which Esculapius was one, caused his incarceration on this, then, penal island. It lies nearly midway between Pergamos and Cos, a few miles from Samos, and somewhere near thirty-five miles from Ephesus. In the first chapter of the book of Revelations St. John mentions the names of the seven churches of Asia giving Pergamos, Smyrna and Ephesus as three of them. In the second chapter he tells the church at Pergamos that they dwell "at Satan's seat." Concerning the Esculapian habit of sacrificing fowl and cattle to the god of healing and eating the edible part of such sacrificed animals he says: "I have a few things against thee, because thou hast there them that hold the doctrine of Balaam, who taught Balac to cast a stumbling-block before the children of Israel, to eat things sacrificed unto idols." He held that the ways of the people of Pergamos, in this particular, were the same as those that had been condemned at the time of Balaam and that they should be opposed. We see by this attitude that there was no attempt at compromise between the Christians and the pagans in matters of faith. For the reviling of the gods the Christians were compelled to suffer, as did Socrates long before their appearance. Pergamos was then the chief center of Esculapean education—the seat of their university,—and hence was called by St. John "Satan's seat." It was here that Claudius Galen acquired the first part of his medical and surgical education, and here that he was born. Beginning his surgical work in the great circus of his native city he

soon discovered that his knowledge of anatomy was insufficient for him to do such work properly and so we soon find him leaving Pergamos and going to Alexandria, in Egypt, to learn more. Priests of all kinds —Roman, Grecian, Christian and Mohammedan—have all condemned dissecting. In Alexandria had arisen a school opposed to all religions, and it not only tolerated, but encouraged dissecting. It was this Egyptian freedom that led the parents of Jesus to take him there and so protect him from Herod. Galen's studies in Egypt made him master of the situation, and the greatest physician and surgeon of his age, as well as converting him into the leading medical authority of many succeeding centuries. It is quite likely that Pergamos and Alexandria had been closely linked, as medical centers, from the time that Marc Antony gave the Pergamos library, of two hundred thousand volumes, to Cleopatra to be transferred to the Egyptian capital. This act of Antony's may have been an indirect influence that made such a man as Galen possible at that early period.

What Galen has been to scientific medicine St. Paul has been to the spread of Christianity, but St. Paul preceded Galen by about a century. The principal medical authority among the followers of Esculapius, at the time of Paul, was Celsius, of Rome. It took about a hundred years of religious conflict for the struggle between Chritsianity and Greek mythology to produce the scepticism toward the latter, that evolved Galen. Without that conflict there would have been no serious decline in a belief in the gods. Without it there would have been no toleration of dissecting and particularly the dissecting of human bodies. Without it Galen would never have been permitted to vivisect animals and acquire his knowledge of physiology. In extinguishing the fires upon the shrines of Apollo and the other Olympian deities, the preaching of Paul forced progress upon a too conservative world. Let us then follow for a while the career of St. Paul.

After our ship passed Cos it made directly for Beirut, passing on the way the important islands of Rhodes and Cyprus. On reaching Beirut we were permitted to go ashore, in defiance of all precedent, at an hour long after medical inspections of incoming vessels usually occur. To our surprise, the table mates with whom myself and wife had become acquainted during the voyage, were no less personages than the new governor of Palestine, his first wife and children. Their freedom to land at that late hour gave the same freedom to all first class passengers. With them was also the son of the Turkish governor of Syria. No one on board had suspected that the pleasant little woman to whom we had been permitted to speak was the "forbidden one" of the highest representative of the Sultan in the Holy Land. She had removed all signs of being a Turk, cast aside the restrictions of the harem, and appeared in Christian costume, without even an excuse for a veil. Before going ashore, however, she was so closely veiled that no one could have told her to be the same person. Next morning, after landing at Beirut, we had the pleasure of going the rounds of the American College, its hospital wards, its lecture rooms in both pharmacy and medicine, and seeing something of its dispensary service. Here is a bit of American civilization, with American teachers and American preachers, planted at the base of the Mountains of Lebanon. We were guests at the home of one of the professors, so had a competent guide and friend to show us around. But we could not stay long here as we had to hurry on to Baalbeck and Damascus.

The railway ride through the mountains of Lebanon is a delightful one. The ascent of the mountains, from Beirut, is particularly fine. At Baalbeck we saw the great temple of the sun and the huge monoliths which its walls contain. They are probably the largest hewn stones in any building in the world. One extremely large one still lies, unfinished, in the quarry at the other

end of the city from the temple. The Arab natives at Baalbeck, and in the region between that and Damascus, reminded us, at every turn, of Mochi, Navajo, and Pueblo Indians. The resemblance in their houses got more and more pronounced as we proceeded so that just before reaching Yahfoufah it became startlingly so. Had we been brought there blindfolded it would have been difficult for us to persuade ourselves that we were not on a Santa Fe train somewhere between Albuquerque and Williams. The flat-topped houses, cliff-edged houses, step-formed houses, absence of chimneys, ladders by which to get into the houses by way of the roofs, adobes, mud ovens, brilliant costumes, and the color of the people all evoked the suggestion.

As we neared Damascus we were made aware of our being now in the ancient home of Abraham, the original source of the peach, the almond, and the damson plum. The river we were so frequently crossing was the Abana of the Bible. At last we reached what is probably the oldest, still living, city on our planet. As we threaded its narrow streets we felt as if we were at last in the land of the Arabian Night's entertainments and might at any minute meet Ali Baba on his way home from a robber's cave. Before Bagdad became the seat of the caliph this city had that honor, so that here grew the original spirit of Bagdad the real home of Ali Baba. Here Mohammedanism flourished when at its period of quickest growth. Here Mohammed's daughter and two of his wives died and are buried. Here St. Paul was converted to Christianity, became the "apostle of the Gentiles," and after escaping from here carried the gospel to all the chief countries that worshiped Apollo and Esculapius. Here the medical aphorisms of the Mohammedan physician Serapion—otherwise known as John of Damascus—were written. Here, in our own age, Buckle, the first of evolutionary historians, died and was buried. Within a few steps of his grave, and near to where tradition says Paul was

AMERICAN MEDICAL COLLEGE AT BEIRUT, SYRIA.

converted, is the place where, in 1860, the Mohammedans massacred over 50,000 Christians, in cold blood. Within the walls of the city is the celebrated "street called Straight," and around it are the bazaars that are the delight of every tourist when he first visits the place. The covered streets permit of marketing in all kinds of weather. The divisions of these streets into regions of special business, permits of easy shopping. Blocks of space are devoted exclusively to saddlers. Still other blocks only contain shoemakers. Then there is the reigon for the carpenter, the region for the green grocer, the region for the coppersmith, the region for the bookseller, the region for the silk dealer, the region for the dealer in silverware, the region for cotton goods, the region for hardware, etc., etc. No where else on earth is this dividing off of business carried to such perfection. In the region of second-handed goods is a subregion for old clothes that is known to everybody as the "Louse Bazaar." The city contains about 200,000 people, and yet there is no delivery of mail. The same divisions that characterize businesses are found in nationalities. Jews, Syrians, Arabs, Franks, Germans, English, Turks, Egyptians, and Italians have each a special region of the city in which to live. A letter addressed to John Brown, Damascus, will be sent to the British postoffice by the letter sorter. There Mr. Brown will call and get it, or the porter of his hotel will get it for him. Nothing more is needed on a letter than the name of the man, or woman, and of the city. If it is an Arab name it is sent to the Arab postoffice, if French to the French postoffice, and so on to all the other offices. If a doctor is wanted one can be found quickly in any part of the European section, while in the Asiatic they are scarce.

If we visit the tombs of great persons, or the mosques, we will soon discover that the masses of the people pin their faiths more to prayers and magic than science, when they are ailing and want to be cured. In all

of these will be found offerings from the sick, from a torn piece of garment to a model limb. Each has been placed there along with a prayer or a superstitious invocation of a magical character. Although there are a number of great names, among ancient Saracenic medical men, none of them were orthodox Mohammedans and all of them were but echoes of Galen or Hippocrates. This is why Damascus has given to the world little of direct value to medicine. Its indirect effects will appear as our story develops. Like Paul, after his conversion, we did not tarry long in Damascus, but proceeded at once to Jerusalem. On our return to Beirut, in order to take ship for Jaffa, we met many tourists whose fate forbade their visiting the Holy Land. The coast at Jaffa being strewn with huge jagged rocks will permit of no landings when there is even a moderate gale blowing. There is no landing place for ships and row boats are frequently knocked into splinters upon the rocks. These tourists had been in sight of Jaffa, desiring to land, yet their ships had to carry them away with nothing better than a distant view of the coast. Some of them had come all the way from the United States, with Jerusalem as their chief objective point, but they were not permitted to get there. We were much more fortunate. Our ship passed in full view of Tyre, Sidon, Acre and Haifa, hugging the coast all the way because the fineness of the weather permitted it.

This is the region of frequent storms, and it was here that Jonah won his bad reputation, and was made food for a whale, because of the tempests that he brought on the ship he was travelling in. It was at Tyre that "Barbarossa" died and was buried in 1190 A. D. For him the ship in which we crossed the Atlantic was named. Christ and St. Paul both preached in Tyre, Hiram, king of Tyre, supplied Solomon with the cedars from Lebanon used in the building of the temple.

As we passed in sight of Acre we were re-

minded of the fact that this was the headquarters of the crusaders during the time of Richard, the lion-hearted, of England, and the refuge of the Knights of St John when the Saracens took Jerusalem. We spent several hours at Haifa where we went ashore and walked the streets to which the boy Jesus must frequently have come from the nearby town of Galilee.

Mount Carmel, at whose foot Haifa lies, is the place where Elijah performed the miracle of drawing down fire from heaven and where he slew the priests of Baal. It was in the neighboring village of Galilee where the last supper was eaten and in which Christ brake bread and gave it to his disciples.

In going to and from our ship at Haifa, Beirut, and Jaffa, we learned that the Arab refrain sung by the boatmen meant expressions like: "Allah is good and will strengthen our arms;" "The Eternal One is kind and will help us pull;" "Thou giver of all blessings carry us safely;" "Thou calmer of the waves let no storm overtake us;" "Oh Allah, thou art our strength and the rock of our defense."

As we went ashore at Jaffa we remembered that it was from here that St. Peter sailed when going on his mission to Rome, and it was here that Napoleon Bonaparte was charged with poisoning plague victims, so that they should not be able to spread infection among his soldiers. The distance from Jaffa to Jerusalem is 54 miles. We reached the latter place at 5 p.m. and put up at the New Grand Hotel, on Mount Zion. As it was the 24th of December we immediately made arrangements for a carriage to take us and our guide to the Church of the Nativity, at Bethlehem. This church is built immediately over what is believed to be the manger in which Christ was born. We left Jerusalem at 9 p. m. for this trip of twelve miles. As we left Mount Zion, passing out of the city, we observed to the east the planet Jupiter, shining with unusual brilliancy, because of the clear, dry atmosphere of that country. As we got nearer to Beth-

lehem it kept rising in the sky and when we reached the church it was immediately over our heads. The coincidence was most striking. Here it was the anniversary of the very night that the Magi followed a star to this same spot. This star—Jupiter—was named after the Roman god of gods. We stopped at the well of the Magi on our way and reached Bethlehem at the same hour they are supposed to have got there. The Church of the Nativity is divided into two parts, one being used by the Greek church, and the other by the Roman Catholic. Both were more than crowded by a surging mass of worshipers. Bishops and priests swung censors, went over extensive ceremonials and at, or after midnight betook themselves to the crypt below the church, where the manger—now converted into an altar—is situated. Lining the entire way, from church entrance to manger were two dense lines of Turkish soldiers with rifles, fixed bayonets, and heavily loaded cartridge belts. Between these the processions of priests were compelled to go bearing the image of the infant Christ, the crucifixes, the emblems of the sacrament, etc. The entire floor of the crypt was covered by kneeling figures busy telling beads and praying Most of them were women and many of them nuns. A narrow space was kept clear for the procession to pass. The Greeks got through their services first so had the first right of way to the manger. The Roman Catholics followed and had the pleasure of seeing the soldiers prodding the dallying Greek priests so as to hurry them out of the way of the second procession. Before these soldiers were placed here, on Christmas eves the conflicting Christians frequently met in deadly conflict contesting each other's right to first descent. Now the Mohammedan soldiers keep the peace. All the worshippers, on passing the manger, bow, cross themselves, use the holy water there provided, and utter prayers as they proceed. With such a crowd present the air was, as might be expected, stifling. At the close of the ceremonies we returned to Jerusalem,

ROME: ISLAND OF THE TEMPLE OF ESCULAPIUS.

and just as we passed into our hotel the city chimes rang out 3 o'clock in the morning.

Seeing Jerusalem is taking a most thoroughly comprehensive lesson in Bible history. Every street, every corner, every hill, every spring, every church, every valley, every gate, every mosque, every hospital, and almost every object one meets is replete with historical connections. Myth and fact are so closely intertwined that it would not be possible for any person to fully separate them. There are places the tales told of which are evident fables while there are others the facts of which are fully attested and of undoubted verity. Every tourist is sure to visit the Mount of Olives, look off in the south and west where lie the Jordan River and the Dead Sea, enter the Garden of Gethsemane, pass through the Valley of Jehosaphat, make a careful inspection of the Mosque of Omar and the Mosque El Aksa, see the many stations where Christ is supposed to have performed certain acts while bearing his cross, and inspect what is left of Solomon's stables and the places from which Christ is said to have driven the money changers. In our hunt for places connected with the evolution of medicine we did not forget to visit the Muristan, or Hospital of the Knights of St. John of Jerusalem, and the tombs of the prophets, where is supposed to lie the remains of Ezekiel who wrote the memorable words: "This is Jerusalem; I have set it in the midst of the nations."

While looking through El Aksa we did not forget that from this spot came the sentimental veneration we have, as American doctors, acquired for the Red Cross. It is a spot likewise venerated by Free Masons, for here stood that part of the Temple of Solomon where the Knights Templars took their rise. While the historical continuity between the ancient Knights Templars and the modern ones is entirely broken, the sentimental connection is binding, even if the former did misbehave. From them came the red cross—the symbol of blood and destruction—while the Knights of St. John

gave us the white cross as a symbol of healing and of Christian charity. These two classes of knights fought the Saracens together, but it was the latter and not the former who gave us hospitals and dispensaries, surgery and nursing. The former were soldiers only, but the latter added to the function of the soldier that of nurse, surgeon, physician and friend. What is left of the Muristan stands near the Church of the Holy Sepulcher. Charlemagne founded a monastery on this spot, but in 1048 it was sold to some merchants of Amalfi who converted it into a hospital. So much good did it accomplish that rich Christians from many countries helped it financially, and out of it grew the order of Knights to which reference has been made. It was not long before the flower of European youths, including even princes of royal blood, took upon themselves the vows of this order and rallied to the defence of Christ against the Saracen and to the caring for the sick and wounded. They established hospitals at most of the large seaports of Christendom so as to care for pilgrims on their way to the Holy City. During the period of the crusades no other organization rendered such valiant service either in the field of battle or on the march. Godfrey of Bologne became a patron of the order, although himself a Knight Templar. During his reign, as king of Jeruaslem, their strength was materially increased. At the taking of Jerusalem, during the first crusade, both classes of knights stood side by side in the siege. It was then that St. George is supposed to have appeared, on the Mount of Olives, and beckoned them on to victory. After that St. George became fixed as the patron saint of the crusaders and the red cross the symbol. In the second crusade Richard, the lion hearted, paved the way for the choosing of that same symbol as the flag of England and the taking of St. George is the patron saint of England. In this way that particular color of cross became familiar on the battle field, and when Dunant Henry

established his organized nursing corps its popularity led to its adoption as their signal. In spite of its utter inappropriateness for such uses as it is now being put to, it has probably come to stay, and no amount of protest will be likely to get rid of it. Its original meaning has become almost completely reversed, just as the original wearers of it, who had sworn fealty to the Christian cause, came in time to execrate and spit upon it as part of their initiation ceremonies. The tragic ending of the order seems to have made the sign they wore the more revered, and has placed it above the much more appropriate white cross, of the Knights of St. John. The latter body, after an existence of nearly 1,000 years, is today in charge of the British Ophthalmic Hospital of Jerusalem with Dr. W. E. Cant as its chief surgeon.

During the millenium of their existence they have had a most eventful career. To their efforts we owe so much—indirectly—for the advancement of medical science that it will probably be long before the debt will be fully acknowledged. Had they done as much in a direct manner, so that children could have been able to see the connection, the acknowledgment would have been made long ago. Tossed, as they were, by Saracenic power to Margat, to Acre, to Cyprus, to Rhodes, to Crete, and finally to Malta, with deeds of bravery marking them at every turn, they acted as the brake upon the wheels of Mohammedanism that held that power back from its self-imposed task of trying to force Islam on Europe. Their defeat at Rhodes is the defeat in all history of which it has been said, "Nothing in the world has been so valiantly lost as Rhodes." Their long possession of Malta, and the fact that it was on this same island that St. Paul was wrecked, induced me to turn aside from the direct route marked for myself, in order to see this queer little gem of the Mediterranean.

Malta is, at present, the Gibraltar of the center of the Mediterranean. It is Eng-

land's stronghold on its way to Egypt and India. The capital of the island is Valette, a city built by the knights on the spot where they had one of the most severe of all their battles with the Mohammedans. Then 2,000 knights successfully beat back 40,000 Saracens killing 25,000 of them. At the close of the battle only 600 knights were left who were capable of bearing arms. The day before the enemy retired they all expected to be killed. In honor of La Valette, their Grand Master, they named the new city. The site is a most picturesque one and it overlooks one of the finest harbors in the Mediterranean. Being built in the 16th century its streets are narrow and occupying, as it does, the side of a hill they are rather steep. Many of the buildings, and particularly the cathedral, are very fine, but the Military Hospital is spoken of as "the glory of Malta." The club houses, or Aubreges were magnificent, but are now converted into public buildings. At the time of knight rule every patient in the hospital had two beds, a wardrobe of his own, and only two patients were put into a single ward. They were waited upon by "serving brothers," their food served on solid silver dishes, the most costly wines supplied, except when forbidden by the medical attendant, their appetites coaxed with expensive viands, and their every wish anticipated. These luxuries have now departed, but the large, airy rooms still make excellent resting places for "Tommy Atkins" when sickness overtakes him. The former residence of the Grand Master is now the Governor's Palace, and in its museum can be seen the mailed coats of armor, the bows, the arrows, the swords, and the flint guns of those old times. The walls of the rooms are hung with the rich and costly tapestries that have not been removed. On floors and walls are many marble mosaics that attest the splendor in which these Knights lived. Perhaps the most surprising feature of Valette is the fine stores and rich supplies of merchandise seen in its chief business

street. To leave any of the surrounding Italian, Greek, or African cities and to visit this is to feel as if one had left the middle ages and dropped into New York or London. The people, of course, look different and their habits are different, but the lavish display of fine goods and plate glass windows is a reminder of Broadway. The women are certainly quite different from London or New York women, inasmuch as they all dress in the garb of nuns. From the beggar woman of the street appealing for alms, to the finest lady in embroidered silk, they are all enveloped in large black veils, hooded over the tops of their heads and extending down to their always black skirts. These nunly costumes are a relic of knightly times when "mother superiors" and "sisters" set the styles for Valette. In the neighboring city of Citta Vecchia, that is almost in the center of Malta, the ladies do not adhere so strictly to this style of dress. A trip there is a unique experience as the intervening country is quite unlike anything one can see elsewhere. It is all divided up into small plots, and as every plot is surrounded by a cobble-stone fence the impression received is that of a huge, but now abandoned, quarry.

As one looks off toward the sea, from the highest point in Citta Vecchia, the scene is very impressive, and in looking northward, in the direction of St. Paul's Bay and Gozo Island, the guide reminds us of Ulysses having been detained by wily Calipso in the latter, while shipwrecked Paul was cast ashore in the former. The guide is always sure to take the visitor into the catacombs, where the early Christians hid from their Roman persecutors, and then to the excavations where exceedingly handsome mosaic floors have been unearthed, that attest the splendor of the Carthagenian homes that were here long before the time of Paul. But Rome subdued Carthage and Paul was on his way with a message destined to subdue Rome. Had that message been confined exclusively to matters of the soul it would not

have been considered in this narrative. Most people are apt to forget that early Christianity started as a gospel of medicine as well as a gospel of religion. Owing to its medical aspect our interest must, for a while, center upon St. Paul. Jesus, the New Testament tells us, came "healing every sickness and every disease among the people." He commanded his disciples to heal the sick. In quoting the old proverb of "physician heal thyself" he applied it to himself, and thus impliedly assumed this title. He referred to the brazen serpent of Moses as typical of himself, and thus assumed as his own the same symbol that had long represented the cult of Esculapius. Luke, prior to adopting the Christian faith, was a physician, and hence either a disciple of Pythagoras or of Hippocrates. Paul and Peter, the two chief messengers of Christ to Rome, were both healers of the sick. All of the Christian apostles were priest-physicians. As the gospel according to Apollo and Esculapius had long preceded these men to Rome it is apparent that a srtuggle for existence was sure to arise, and that the result would be either the total suppression of one or the other, or some sort of compromise would occur. Facts indicate that the latter happened. It is not at all probable that either Peter or Paul were able to foresee the far-reaching consequences of their visits to Rome. No more did Paul foresee that his preaching was to cause the merchants of Amalfi to establish in Jerusalem a hospital that would finally make all Europe—indeed we might say all the world—debtors to him, nor that the forces that did this should center upon the very island upon which he was wrecked. In following him to Rome let us turn aside, on the way, and look at Amalfi and the region immediately around it. The circuit generally pursued by tourists, in going to see Amalfi, constitutes what is probably the finest short tour upon the earth. It is one continuous panorama of loveliness and wonder, from the time of leaving Naples till the return to Naples again. Who has

not seen this has not seen the ne plus ultra of astonishing sights and of grandeur. The Blue Grotto, at Capri, is alone worth a trip to Italy to see. The pearly blue lustre of the salt-water within the cave, its fairy-like splendor and suggestiveness of liquid fire when it is struck by the oars or splashed by a bather, is a wonderful sight. Then there is the magnificent view from the Villa Tiberius, with the accompanying thought that this was the home of the Caesar who ruled Palestine when Pontius Pilate, his representative, gave up Jesus to the rabble for crucifixion. But who can describe the carriage drive from Sorrento, through Amalfi, to Salerno, or who adequately describe Pompeii, Herculaneum, and Vesuvius? Every step of the way is not only indescribably grand, but is all a mass of petrified history. How could Columbus have found his way to America, or Vasco de Gama to India, had not Amalfi given us the mariner's compass, as it likewise gave us the Knights of St. John? What would modern medicine have been had the University of Salerno not rekindled the fire—almost an extinguished fire of medical education? Where would our latest researches in biology have come from had the aquarium at Naples not initiated the new dispensation of experimental biology? Yet the inspiring influences that, step by step, led up to these is clearly traceable to Rome. "All roads," we have been told, "lead to Rome," and it is quite certain that all suggestions and all cures of the middle ages that paved the way to modern methods of thought, once had their home in Rome.

We have already referred to the pestilence which occurred in Rome, in B. C. 291, during which embassadors were sent to Delphi where the oracle told them to go to Epidaurus for succor. It was then they carried one of the serpents, that were common in the grove of Esculapius, to Rome as the representative of the god of healing. When the ship arrived in Italy the serpent was carried to an island of the Tiber, in Rome,

where a temple of Esculapius was built in commemoration of the event. Ovid tells us that after the "salutary serpent" reached Rome the plague subsided and,

> "Now no more the drooping city mourns;
> Joy is again restored and health returns."

At the time St. Paul reached Rome the Esculapean temple of health stood upon the Insula Aesculapii where the Church of St. Bartholomew now stands. This island was constructed in the form of a ship, a tall obelisk in the centre represented the mast, the hospital wards on the sides were the cabins, and in the bow there was placed a duplicate image of that of Escalapius at Epidaurus. Parts of the travertine bulwarks are still shown within the monastery garden of St. Bartholomew and numerous votive offerings, in the form of terra cotta limbs that have been dug up there, are on exhibition. As has already been stated the chief representative of the cult of Esculapius at Rome, on the arrival of Paul, was Celsius. Nero's physician, at the time Paul was beheaded, must have been Andromachus.

He was, perhaps, the first of the so-called Archiaters, or royal healers. Following him came Popular Archiaters or public health officers. They were paid certain sums by the city besides having special regions reserved for them to practice in and where no other healer was permitted to take cases. Visitors to Rome always go first to see the splendid monument of St. Peter's—the glory of the Roman Catholic Church. Not so many go to see Santa Paulus, on the Way of Ostia, that is supposed to mark the site of St. Paul's grave. In some respects it is more interesting than St. Peters. When, under Nero, these two messengers of Christianity were martyred who could have foreseen that the principles they had planted in that city were destined to control it and its empire and that such splendid monument's would be erected to their memories?

But the parts of their teaching that have survived are not the medical. It was less than a century after their deaths that Galen

came and laid the seed that long after developed along the lines of true progress. It was necessary, however, that much of the superstition of the Esculapians should be destroyed and its destruction came about through the friction in thought between it and Christianity. Mohammedanism came in at a little later date giving a triple conflict. Wars and pestilences followed and these tested the value of the respective claims and kept testing them long after the name of Apollo was forgotten. As the sequel will show a large amount of Greek superstition still survives in the public mind, owing to its having been adopted by monks, knights, and priests, all over Christendom. Even to this day, in Ireland, in Spain, in Italy, in Russia, in Greece, in Austria, in Turkey, and in Syria, one can find votive offerings hung around tombs, churches, holy wells, shrines, and abbeys, while the practice of incubation is still perpetuated in many Christian countries. Sir T. Clifford Allbutt has recently said, "The history of medicine, broadly speaking, is melancholy reading; it is a record of devastation by pestilence, deplorable blights upon family life, and catalogues of medical formulas and practices as prodigious as the plagues before which priest and physician alike vaunted themselves in vain." Bad as it is it would have been much worse but for the conflict of opinion which arose through the struggles of rival religions in whetting thought and encouraging the proving of all things and holding fast that which, on trial, turned out to be of value:

"For all of good the past hath had remains to make our own time glad,
Our present daily life sublime, and every land a Palestine."

MEDIEVAL AND RENAISSANT.

To Italy, more than to any other single country in the world, we are indebted for the earliest intellectual impulses that led in the direction of modern medical science. To the same country, however, we must credit the retarding influences which, for centuries, almost extinguished the spark from Aristotle that constituted the vital principle which finally led to science. During medieval times every idea of right had crystallized into inalterable formulas that it was deemed sacrilege to alter or disturb. The school at Salerno had accumulated a considerable amount of the semi-digested truths of the old Greek followers of Esculapius and the male and female professors of that institution were teaching them, to men and women students, in a most perfunctory manner. It is not quite certain just where the inspiration came from that made the Salerno school possible, but the facts seem to point to the monks of St. Bernard, of Monte Cassino, as the source of its parentage. These monks had in turn gained their light from the Greek traditions that hung around the temple of Apollo which they had appropriated as their home. Before the beginning of the ninth century the fame of Salerno, as a proper place in which to acquire medical knowledge, had extended to the ends of the civilized earth. The students were of many nationalities so that from here went forth most of the trained medical men of the world. But the blight of conservatism was upon this institution as upon almost everything else of that period, and as a result not one name, within the long list of its professors, has come down to our day as

ever having done or said anything that would tend to immortalize his or her memory. When the new era of research came in Salerno clung fast to its traditions, entered into senility and, as a consequence, perished. The city still occupies the same beautiful site, on the Bay of Salerno, but its streets echo no more the noise of its polyglot students and the college buildings have left no trace of their ancient glory. But although as a corporate body it has disappeared from the earth it has left behind it some very healthy progeny. These the medical visitor to Italy can illy afford to miss seeing. The three most important, from the view-point of evolution, are the Universities o f Bologna, Padua and Pisa. Not to see these is, for the medical tourists not to see Italy. My sight-seeing in this land of sunshine and historic romance, included the museums, palaces, and picture galleries of Rome, Florence and Sienna, the catacombs, churches, historic fountains, and ancient ruins of Rome, the cathedral monuments and palaces of Milan, the homes of the Doges, historic churches, and canals of Venice, the leaning tower and baptistry of Pisa, the monuments, palaces, and grand natural panorama of Genoa, and the vast multitude of beautiful and interesting sights in and around Naples, but none of them gave me the satisfaction that came from an inspection of the ancient Universities. Until I had seen the places where the germ of modern enlightenment began its unfoldment, where human eyes first saw the early dawn of liberty and truth, and where the struggling forces of radical and conservative thought found fitness in a genuine appreciation of that knowledge which has its foundation in the solid ground of nature, I was certain that I had not seen the best that Italy affords.

A study of the universities of Salerno, Bologna, Padua and Pisa, combined with a due appreciation of the weakness as well as the strength of Papal Rome, can supply the mind with a knowledge of how we came by a circumnavigated earth and much of the

glory of this twentieth century of civilization. A single glance at a few of the names in the glittering galaxy of stars that shone out among the professors and students of these places of learning will quickly tell the tale of what they did for modern medical science. Bologna, the parent institution of Padua and Pisa, gave us Vesalius, the creator of modern anatomy, as one of its teachers. But as he taught in all three of these institutions every medical tourist should see them all for his sake alone. And what a battle he fought for us. Bat-eyed followers of inherited ideas refused to see the light that he produced. Look at Sylvius, even after Vesalius, had long been laid to rest, taking up the cudgels for Galen. Vesalius' demonstration that Galen's anatomy was defective inasmuch as he claimed for man an intermaxillary bone, as is found among the lower animals, Sylvius would not accept. When confronted with the actual skeleton of man he dared to reply: "Man had this bone when Galen lived. It is luxury, it is sensuality that has gradually deprived man of this bone." Another of the great men who taught at Bologna was Malpighius, the one who first described the development of an embryo, who first saw and showed to the world a blood corpuscle, who completed the work of Harvey by showing the capillary circulation, who discovered the cutaneous glands; who showed wherein the difference lay between negroes and whites by discovering the pigmentary layer of the skin, and who discovered the malphighian tubes and capsules of the kidneys. Mondino, the great anatomist, was also a teacher at Bologna and de Chauliae, the restorer of French surgery was his pupil there. Petrarch and Boccaccio, the fathers of the Renaissance, that brought redemption from darkness to Europe, were taught at Bologna and launched their much needed reformation from that seat of learning. Realdus Columbus, who almost completely anticipated Harvey by discovering the pulmonary circulation, was a pupil of Vesalius and lived and taught both at Padua

and Pisa. Fabricus, the discoverer of the valves of the veins and the first to cast discredit on the old notions of embryology, taught at Padua. Harvey, the immortal discoverer of the complete circuit of the blood and the first to declare that all life comes from pre-existing life, was a pupil of Fabricus. In France, England, Germany, and elsewhere he was jeered at and mocked by the leading professors of physiology and anatomy, for daring to publish his "Exercitatio du Motu Cardis et Sanguinis" (Concerning the Motion of the Heart and Blood in Living Creatures). Riolan, the leading anatomist of Paris, jeeringly declared that what was true in this book was not new and what was new was not true. Fallopius, the discoverer of the fallopian tubes, taught at Padua and Pisa. Wirsung, the discoverer of the excretory duct of the pancreas, studied at Padua. Galileo, the world-renowned astronomer, taught at both Padua and Pisa. At the latter university he invented the pulsilogen—the earliest precursor of the sphygmograph—in order to test the oscillatory time of the chendalier in the baptistry at Pisa. There were no watches or clocks in those days, and so his own pulse was thus brought into use in order to discover a great law of nature. Caesalpinus, the greatest of the physician-botanists of the period of the Renaissance, taught at Pisa. Linneus called him the first systematic botanist of the world. His country claims for him the honor which the rest of the world gives to Harvey. Independently he made the same discovery of pulmonary circulation as did Realdus Columbus, but he did not trace the entire circuit of the blood as Harvey did. He was, however, the first to use the expression, "Circulation of the blood." Many other names of equal greatness came into prominence from these institutions in other departments of science than that of medicine. The famous universities of France, Great Britain, and Germany took these as their models, so that they are really children of the Italian schools.

What was the cause of such greatness? How came they to break the crust of medieval conservatism? Wherein lay the secret of their strength and of their rapid growth? How came Bologna to have as many as ten thousand students upon her rolls in a single year? Why were most of these students from foreign countries and chiefly from Germany? To get a proper answer to these questions is to discover the secret mainspring of medical evolution in the middle ages.

As my readers have already been informed, the good ship Barbarossa, of the North German Lloyd Company, carried myself and wife across the Atlantic on our grand tour around the world. The name "Barbarossa" hung like a vision of the past in some remote corner of my cerebrum.

"Who was this Barbarossa," I was asked, "for whom this ship is named?" All I could then reply was that the German king, Frederick I, who took an active part in the Crusades, bore this title. No one on board, among the passengers, seemed to know any more about him than I did. Not content with this meagre recollection, and having my curiosity aroused, I began the search for better information. Very soon I discovered that he was the central figure of Europe's greatness, for reasons that I am about to give. He stood in the center of a charmed circle of human ideality that has made the earth much different from what it would have been without him and without the idea he represented. To understand him and this idea to which reference is made we must go back, in imagination, to the year 800 A. D. when Pope Leo III crowned Charlemagne of France, king of kings and spiritual perpetuator of the Roman Empire. By the theory of the Catholic Church Charlemagne became the ruler of all the earth. To him every king became a subject and every kingdom a vassalage. He had, at this time, conquered a goodly part of the earth, but in no spiritual sense was he believed to have the divine right to rule until it came to him, from God, through coronation by the Pope. Never, at

A WING OF THE MEDICAL SCHOOL AT PISA.

any time, did either he or his successors become the accepted rulers of the kings of all the earth. After his coronation he became, thence forth, so far as the Catholic world is concerned, the Emperor of all true Catholics, and of what is known as "The Holy Roman Empire." The various orders of knights arose, at a later date, as the warrior priesthood of this theoretical empire. They became to it what the Catholic clergy are to the church and its Pope, real soldiers of the cross, chosen defenders of Christ, and promoters of Christian chivalry. Along the line of approved succession, to the title of Caesar (Kaiser) in this Holy Roman Empire, came Frederick Barbarossa the king (Koenig) of the Germans. Because of the color of his beard his Italian subjects called him Barbarossa, which literally means red-beard. He was crowned emperor, at Rome, by Pope Adrian IV, in 1155. His own ideas of the dignity of this honor are set forth in a letter which he wrote to his German prelates, in which he says: "On earth God has placed no more than two powers, and as there is in heaven but one God, so is there here but one Pope and one Emperor. Divine providence has specially appointed the Roman Empire to prevent the continuance of schism in the church." It was in his capactiy of emperor that he led the knights, to the attack upon the Saracens, during the great Crusade in which he met his death. Of this event Brice, in his History of the Holy Roman Empire, says: "Germany was proud of a hero who maintained her dignity so well abroad, and he crowned a glorious life with a happy death, leading the van of Christian chivalry against the Mussulman. Frederick, the greatest of the crusaders, is the noblest type of medieval character in many of its shadows, in all of its lights." As leader of the knights, and as head of the crusaders, he becomes the pivotal figure in surgical and medical experience that the crusades naturally brought. As spiritual chief of the Knights of St. John of Jerusalem, he was the director of their hospitals and head of

their nurses and physicians. Not to dwell on this phase of his connection with medical evolution we must now consider the part which he took in the advancement of medical education. Of course it is impossible to separate what he did for medical education from what he did for education in general.

When on his way to the Holy Land Barbarossa found a condition of almost perfect anarchy at Bologna. Citizens and students were at war with one another. "I was a stranger and ye took me in" was the literal state of affairs of all students in that unhappy city. They were being robbed right and left and abused besides. Italy, at that time, and for generations before as well as after, was wracked and torn by party strife. City was at war with city and citizen with citizen. Questions of policy in government, between the popes and the emperors, were constantly bringing friction. A political party known as the Ghibelines stood by the policies of the emperors, while another known as the Guelphs hung with equal tenacity to the side of the popes. Padua and Pisa were usually Ghibeline, but Bologna was generally pretty evenly divided. A majority of the students were Ghibeline, while most of the permanent citizens were Guelph. Hence the antipathy between them. When Barbarossa passed that way trouble between citizens and students was at red heat. He at once had a code of regulations drawn up fixing the rates of charges upon students for necessary things, uniting all the teaching bodies into one corporation, and giving to students the right to appoint officers to try cases against themselves. Thus began the university. From this, with modifications, have come the pattern for all other universities that have come into existence. Prague, the earliest German university, copied from this. Disconnected schools there had been long before, but not universities. It was after the new incorporated form that Bologna grew to its unwieldy size, and it was the rights and privileges which he gave to students that tempted them, in such great

numbers, to go to Italy for their education. It was this growth that created the need of Padua and Pisa universities, although the latter practically began its existence in Florence. Frederick II, grandson of Barbarossa, while he was Roman Emperor, established a university at Naples, but made the medical school at Salerno a department thereof and forbade the starting of any other medical school within the kingdom of Naples. Notwithstanding this monopoly Salerno began its decline. A new era was upon the world. The friction between Ghibelines and Guelphs had compelled men to think, and this independence of thought prepared the world for higher things which conservatism refused to accept. The death of Salerno as an educational center was thus foredoomed because it refused to keep abreast of progress.

All visitors to Rome visit the Vatican Palace. Comparatively few take the trouble of turning aside, from the Coliseum, to go and see the not far distant Lateran Palace and its wealth of historic treasures. The former is the home of the present pope, the latter the homes of the early popes from the time of Constantine up to the year 1309. Owing to the troubles between the popes and the emperors, which culuminated in the imprisonment of Boniface VIII, and his death in a few months thereafter, his successor, Clement V removed the seat of the papal court to Avignon, France, where it continued till 1377 from 1309.

In order to see Avignon the writer took a detour from his intended course, visited southeastern France, and thus made the acquaintance of the original "Windy city." Two objects inspired my movement in this direction. It was my desire to see the last resting place of John Stuart Mill and his beloved wife, and to become acquainted with the early haunts of the man who turned the world from the darkness of the dark ages to the luminousness of the Humanities. The immortal Petrarch was born near Florence, Italy, but his father having been banished from that city, along with the world-renown-

ed author of The Divine Comedy—Dante—drifted to Avignon. Both Dante and Petracco, being what were called White Guelphs, got into trouble with the more orthodox Black Guelphs, had their property confiscated, and were banished from Florence. They were treated as Ghibelines and, therefore, as enemies of the city and of the pope. To this banishment the world appears to owe much. But for it Petrarch would probably never have lived at Avignon. But for it he would, most likely have been, like his father, a lawyer instead of a priest. But for it there is no likelihood that his emotional nature would have received the strain that moulded him into the foremost poet of his age. But for it we have little reason to believe that he would have become the chief apostle of the Humanities. The story of his preparation for the part he has played in this world's development is one of pathos and of romance. As a young man he was a devoted Catholic and very pious. Soon after taking holy orders he met in the church of Santa Clara, Avignon, a pretty young woman, the first sight of whom captivated him. He thought he had never before seen anything so beautiful. On several successive occasions he met her again, but never reached close acquaintance. To his consternation he soon learned that she was the wife of another, so that there were two most serious obstacles between them—his vow of celibacy and her marriage. He struggled against his passion until he thought he had completely mastered it. Some years later he and his brother took a walk from Avignon and climbed Mont Ventoux for the first time. The day was a most lovely one, the sky and air faultlessly clear, and the scene intoxicatingly enchanting. Behind him lay the snow clad peaks of the peerless Alps. Before him was the long green valley of the Rhone dotted with villages, forests, castles and cities. Beyond this were the curving summits of Les Cevennes. To the south lay Marseilles with the blue waters of the Mediterranean, laden with the fleets of many nations, and

MONKS CEMETERY AT ROME.

framed in a curving coast of bewildering fantasy. He was enraptured and felt as if this must surely be a foretaste of paradise. Looking far down the mountain toward its base his eyes rested on Avignon, he thought he could see the church of Santa Clara, and in his ecstasy the beauty of his surroundings called up again the beauty of that face which he had striven to forget. In an instant the old spell was upon him, and in order to get the mastery of himself he took from his pocket the "Confessions" of St. Augustine that, as a priest, he always carried with him. In the very height of his ecstasy he opened the volume at random and, to his consternation, read: "Men go to gaze on lofty mountains and the mighty waves of the sea, and the wide currents of rivers, and the vast extent of ocean, and the circling courses of the stars, and they overlook themselves." The book fell from his hands as he raised them to his tear dimmed eyes. He saw in this the hand of God. Again picking up the fallen volume he started hurriedly down the mountain, with a heavy heart, and full of shame and contrition he went that night to his confessional. Thenceforward he was a different man. His heart was toned to a new passion—that of poetry. His verses were well received and when he touched the chord of the love—the lost love of Laura—his Madonna Laura—he caught the ear of the world. His Latin epic of Africa next won him distinction among the learned, and it was not long before he was crowned Roman poet, in the Holy City. The author of the article "Petrarch," in the British Encyclopedia, says: "The ancient and the modern eras met together on the Capitol at Petrarch's coronation, and a new stadium for the human spirit, that which we are wont to style Renaissance, was opened." This occurred in April, 1341. Six years later Black Death entered Central Europe, by way of Genoa, and spread itself all over that continent. In April, 1348, Laura died of the plague, and in the same year he lost, from the same disease, many of his nearest and dearest

friends. Ever after his poetry assumed a still graver type, and his "In Morte di Madonna Laura" is one of the saddest ever written. Two years later he met and made the acquaintance of Boccaccio, at Florence, and from the friendship that sprung up between these two great scholars it would be difficult to estimate the good that has come to this world of ours. Through their united efforts the shackles were broken and removed from the intellects of men. Their humanism was the vital element that made universal education possible. To them belong the credit of having determined the revival of learning and the destruction of the mental slavery of the dark ages. Without Petrarch Boccaccio could have done little, and to Petrarch belongs the credit of directing aright the mind of Boccaccio. In medical reformation the sledge-hammer blows of Petrarch were well aimed and effective. His book upon "My Own Ignorance and That of Many Others" was a most scathing indictment of the medical practice of the fourteenth century. He deemed their teachings narrow and impious. Narrow they certainly were whether they were impious or not. None dared to deviate a hair's breadth from the traditional letter of Galen or, if not direct Galenites, from the interpretations of Averrhoes. The shock of his attack was needed and the result effective. The horror of their helplessness in facing the terrors of the successive waves of plague lost them much of their ancient prestige. Petrarch had good cause to be sceptical and the public came to prefer quackery to the science, such it was, that they represented. But they were not entirely to blame for their helplessness. The church ascribed pestilence to the "pleasure of the almighty God," and a terror stricken people could scarcely be expected to be amenable to reason. If it was God's pleasure that so awful a disease should devastate the land what help could any one hope from human efforts. Again, the church took from them all right to dissect human bodies so that for knowledge of

anatomy they were tied to that of quadrupeds.

A bull of Boniface VIII, excommunicated whoever dared to dissect a human body. This was issued but a few years before the so-called "Babylonian captivity of the church"—the removal of the Pope to Avignon It would be hard, however, to say which were the most superstitious, the doctors or the priests. Both were to some degree above the masses, but both were compelled to pander to a condition of ignorance that was condoned rather than condemned. The doctors did not have a free field for their efforts, for not only was there the usual "domestic" superstition regarding the proper care of the ailing, but there was, likewise, direct competition from the monks. For centuries these last named had been making good livings by charging large fees for remnants of ancient martyrs, waters of reputed holy wells, and portions of the "true" cross. Where these failed, or were deemed inadequate, prayers to saints were substituted, on the theory that these saints would intercede with Christ in behalf of the sufferer.

St. Anthony, the founder of their order, having a great reputation as a healer of the sick, was petitioned in behalf of all sufferers from "sacred fire," or St. Anthony's "fire," names they gave to erysipelas. Most pictures of this saint show a fire by his side as typical of his power over this trouble. St. Valentine, who miraculously healed the deformed son of the Greek rhetorician Craton, was invoked for the cure of epilepsy and kindred disorders. St. Vitus, who was reputed to have healed the child of the emperor Diocletian, and whose father claimed to have seen him while in prison, dancing with angels was appealed to in behalf of those suffering from chorea, i.e., St. Vitus' dance. As insanity, and some forms of poisoning, manifested themselves in symptoms that simulated dancing this saint was likewise appealed to for these. In treating sore eyes the appeal was made to St. Clara, and in cases of toothache St. Appolonia was called upon for help. The theory that led to the reliance upon St.

Vitus, in chorea, was a very ancient one, although generally accredited to Paracelsus. Many medical men of early times did not hesitate to use it as a guide, as it conformed well with the religious conceptions of those times. Known by the name of the doctrine of signatures it affirmed that God had stamped on many things marks which indicated that he intended them to be used for the healing of the sick. It was a sort of similia similibus idea, inasmuch as colors similar to jaundice were believed to mark the plants capable of curing that affliction. Only plants with yellow flowers were deemed appropriate as remedies therefor. For blood diseases blood-root was deemed a proper remedy, and in case that could not be procured red flannel might take its place. This notion still lives even in civilized America. There are great numbers of plants that now bear names indicating this idea of curative virtue. Bright-eye, kidney-wort, mandrake, golden-seal, Jew's-ear, etc., are among the best known. These, of course, are English names, and only include the English phase of this delusion, but they answer better, as an illustration of the principle, than would unfamiliar Latin ones.

In olden times scrofula—general tuberculosis—bore the name of king's evil because of the then universal belief that royal persons had the "gift" of being able to heal this disease by the "laying on of hands." Dr. John Brown, surgeon to Charles II, of England, wrote a learned treatise to demonstrate the truth of this kind of healing. His royal master, during his reign, touched nearly 100,000 people for this disease. Not until the ascent of William of Orange was any effort made to check this kind of superstition in Great Britain. The first and only patient that he was willing to touch he rebuked in these words: "May God give you better health and more sense."

No better illustration of the mental attitude of the great masses, during the time of Petrarch, can be produced than that of their ideas concerning Caterina Beincasa of

Siena. Because this girl, a dyer's daughter, and a hysterical cataleptic, flogged herself till the blood streamed from her body, refused to comb her hair or wash her face, lived upon uncooked vegetables, wore a chain of iron around her body that gradually ate its way into her flesh, claimed to be in communion with Christ three times a day, fell into frequent trances, and finally, as testified to by her confessor, father Raimondo, received upon her hands and feet a supernatural impression of the scars and wounds that Christ had after being nailed upon the cross, was almost universally acclaimed a sacred person. This last so-called miracle is said to have occurred during a trance, which she had immediately after receiving the sacrament. As soon as she came out of it she called father Raimondo and said to him, "Be it known to you, my father, that I now bear on my body the marks of the crucifixion of our Lord Jesus Christ." She described to him the vision she then had in these words: "I saw the crucified Lord descending towards me with a great light, which caused me, from the impetus of my soul to meet its Creator, to raise up my body. Then I saw five bloody rays descending from the scars of his most holy wounds, and directing themselves to the hands and feet and heart of my body. Upon which knowing what the mystery was, I exclaimed, O, Lord, my God, let not, I pray you, the scars appear externally upon my body, it is enough for me to have them internally. Then while I was yet speaking, the rays, before they reached me, turned from blood-color to a pure and splendid light, and touched the five parts of my body—that is my hands, my feet, and my heart." This young woman was canonized by Pope Pius II, and thenceforth has been known as Saint Catherine of Siena. That her power over the men and women of her time must have been very great is attested by the fact that whereas Dante, Petrarch, the princes of the church, the greatest and best men in Italy, had striven in vain to persuade the Popes to leave Avignon and return to

Rome while she, a practically insane young woman, was able to succeed. In the summer of 1376 she proceeded to Avignon, pleaded with Gregory XI, and against his own interests and the interests of his own country of France, caused him, in the September of that same year, to return to Rome. Mr. Heywood, in his Guide to Siena, tells us that "it would hardly be too much to say that, for many persons, Siena is simply the town of St. Catherine." The House of St. Catherine is one of the first places that the local guides take tourists. It was here that she was born. It was here that she had her vision of betrothal to the Infant Christ and that has become a favorite theme among painters. In this building are kept many relics of this saint and celebrated artists have decorated its rooms with the best of their art. The Hospital of Santa Maria della Scala is where she acted as nurse during the plague. In the chapel of St. Catherine, of the church of San Domenico, there is a shrine in which is kept her head. Baedeker stars the frescoes, by the celebrated artist Sodoma, that adorn this chapel and pronounces them "admirable." The graffito pavement is said to represent Esculapius, but this has been questioned by Mrs. Alcott. In death, as in life, St. Catherine has been honored in a manner that can leave no room for doubt of the high estimate in which her fellow citizens, held her. In our day she would be consigned to a mad-house, if she attempted such antics as artists, historians, and her father-confessor declare her guilty of. Yet it was these very acts, and not her devotion as a nurse, that won for her the favors she received. No Hindoo fakir ever went to greater extremes of wild fanaticism. Never did the Hindoo people pay more reverence to their insane "holy men" than did the people of Italy to this woman.

When we pause and try to picture the mental condition of the then best civilized part of the earth, and of some of the best people of that time, as displayed in their reverence for St. Catherine, how is it pos-

sible for us to refrain from feeling that Petrarch's work was needed and needed badly. The so-called educated masses required enlightenment in order to permit of the use of enlightenment in treatment by physicians. If, in this age, the scientific medical man is held in check by popular superstition what must it have been at that period in the world's history? Petrarch appeared none too soon as the high priest of popular enlightenment What if it was carried on as a fad by many the results show that the earth was ripe for it. He inspired men to start libraries, collect coins, relics and other material for museums, study classical authors of every kind, and drove medical men from the slavery of a single master to the freedom that came from many. In many ways he was very narrow himself, but his wide scheme of catholic conception made him build better than he knew. The foundation he laid wiped out narrowness of vision for many, and its results are still wiping out narrowness of vision for more.

But for the reform of mental method which he started it seems impossible to conceive of there having come into this world, at the time they did, the men of whom we are so proud today. Strike out Petrarch and it surely looks as if we could have had no Vesalius, no Malpighius, no Harvey, no Caesalpinus, no Realdo Columbus, no Fabricus, no Galileo, no Copernicus, nor any of the free minds who dared to defy tradition and sacrifice their comfort in behalf of natural knowledge. Humanism was the survival of a fitness that very quickly gave us the great universities of Strasburg, Nuremburg, Basel, Augsburg, Heidelberg, and all other great institutions of this kind. Had it not broadened men's minds it is hard to see how we could have reached the conditions that gave us a Christopher Columbus, a Vasco de Gama, or a Magellan. The great Professor Emil du Bois-Raymond, in an article upon Civilization and Science, published in the Popular Science Monthly many years ago, in referring to this period of the

world's development says: "The best minds of the time expended no end of labor and ingenuity in distinguishing between absurdity and nonsense. Like a plant in the dark, the ancient philosophy put forth colorless and weakly sprouts which sought the light mainly in two directions, platonistic tendencies finding expression in an insane gnosticism, and Aristotelian tendencies in barren scholasticism. Scholasticism held the ground longest, and the sholastico-ascetic period will always remain as a warning to show what length the unaided human mind, divorced from the world of reality, and without the revelation of Nature ean go astray. Inasmuch as humanity recovered from this madness through the study of the ancients, revived by Petrarch and Boccaccio, the next ensuing stage of development is called the stage of humanism. * * * * * * * As we have seen, the ancients knew nothing of natural science, in our sense of the term. Is it not, then, a very curious circumstance that the resuscitation of classical studies should have given the impulse to the development of modern natural science? That the ancients, who themselves could not think scientifically, nor experiment, nor even observe, should now, by their teaching and by their ideas, produce a race in whom these faculties were to go on steadily and incessantly developing—a race bearing to the authors of its intellectual culture the same relation as subsists between a brood of ducks and the hen that has hatched them out?"

It was simply and wholly due to the emancipation of men's minds from the control of the bigots who scented danger in every new truth and considered themselves the ordained of God for the censuring of all ideas that did not seem to suit their fancy. Slowly but surely we are learning that the men of new ideas are the men to be encouraged, while the men who refuse to let mankind know that a new idea has facts behind it are the worst enemies of the race.

IBERIA AND LUSITANIA.

MUCH as medical science owes to the crusades, and great as is its debt to the renaissance, it could not have reached its present altitude but for the discovery of America. Had Christopher Columbus failed in his venture we would have had no voyage of the Beagle, no explorations of South America and the Pacific Islands by Darwin, no studies of the fauna and flora of Netherlands India by Wallace, and no deep sea researches of the Challenger. Take these away and what would happen to our modern doctrine of Evolution, how much would we know of the causes of adaptations, and where would we stand in relation to modern biology, with its physiology, bacteriology, protozoology, pathology, and principles of immunity? To the mind unaccustomed to tracing historical effects to their causes it would probably appear as if we could have had all of the latter without the former, but, to one who with a scientific bent of mind insists on knowing why things are as they are, the answer is obvious. Had there been no Columbus we could have had no cinchona or quinin, no erythroxylon or cocain, and none of the other remedies that this new continent has added to our materia medica. Nor could we have had india rubber for the multitude of uses to which it is being put by surgeons, gynecologists, and general practitioners If we inquire why Columbus dared to make so hazardous a voyage and why Ferdinand and Isabella finally consented to risk their money on such a venture we will discover that it was because it was deemed a paying investment from the view points of commerce and conquest. If we ask regarding the character of the commerce that

acted as a tempting bait we learn that it was spices, balsams, antiseptic gums and just such goods as were required by the medical men of those times. If we ask for the names of those who made such a voyage possible at that time, we will learn that the venture would have been an insanely hopeless one, but for the astrolobe invented by the two physicians of John II of Portugal. By its aid, for the first time in the history of the world, it became possible for sea-faring men to tell their latitudes and longitudes when far out of sight of land. The world remembers Columbus but forgets Drs. Roderigo and Joseph, without whom Columbus would not have been heard of in our day. If we ask who it was who supplied Columbus with the chart of the earth which he used in order to guide himself, the chart he used in order to convince Ferdinand, Isabella and the friends secured at their court, of the truthfulness of his speculations, we learn that it was drawn by Dr. Paola Toscanelli, a Florentine physician, from the few really scientific facts known at that time. If we ask who it was that came to the rescue of Columbus' theory, when the royal junta had given what was to have been a final and irrevocable decision against Columbus, we learn that it was the scientific friend and councilor of the former father confessor of Queen Isabella, at the convent of Santa Maria de Rabida. Had Dr. Garcia Fernindaz, of Palos, refused at that time to strengthen the convictions of the head of that monastery there is little likelihood that Columbus would ever have sailed in the Santa Maria, which was named from it.

In order to fully appreciate the motive that led to the daring act of Columbus, let the reader go with me, in imagination, to Genoa, the city in which Columbus was born. Our trip, however, must predate the birth of the great navigator by over a century. We will visit the prison of that city in 1299. Within one of the dungeon cells we will discover a prisoner of war on whose words were hanging the destinies of mil-

lions of human beings yet unborn. During the year 1298 the commercial rivalry of Genoa and Venice had reached such a point of angry fervor that fleets from the two cities met in mortal combat. Genoa won and took 7,000 Venetians as prisoners of war. The hero of our story was one of these prisoners. In order to pass the dreary nights and days of a year's incarceration he recited to a fellow-prisoner some of the principal events of his life. The listener being captivated by the narrative, and being a good penman, committed each day's portion of the story to paper. When they were freed this record was published and it was to it, more than any other single circumstance, that Columbus owed his success. From the facts of this narrative Dr. Toscanelli was able to construct the chart which Columbus used. It was the implicit faith which the Spaniards had in this narrative that made the proposed voyage seem so alluring. It presented to their imagination visions of wealth for Spain beyond the wish of avarice. The Venetian prisoner was the now celebrated Marco Polo and the narrative his tale of the wealth and splendor of the countries of far eastern Asia. Venice had become immensely wealthy through its importations of spices and Asiatic gums. Alexandria had waxed rich on the duties it exacted from Venice for letting these goods pass through Egypt. The Pope had given to Christian countries full ownership in all heathen lands that they discovered and started to Christianize. In that day this meant the same to the people of Europe that a guarantee deed to a city lot now means to an American. To reach eastern Asia by sailing to the west meant the securing of immense land possessions and the ownership of these lands meant the taking from Venice and Alexandria their commercial supremacy. The one great doubt of those not swayed by religious tradition was regarding the ability of Columbus to cross the unknown seas. Spain held him, under driblets of pay, for many years in order to keep him from going to some other country and mak-

ing the same offer to another king. Fearing to make the venture itself it, nevertheless, feared still more the possibility of another country doing the thing it hesitated to do. When, at last, Ferdinand was about to accept the offer of Columbus, his courtiers objected to Columbus demand that he be made governor of the discovered regions. This was proof that they had a strong suspicion that Columbus was right and that he would, by such an arrangement, become greater than the greatest of themselves. And all this was due to their belief in the prison-written narrative of Marco Polo. But this was over a hundred years later than the writing of that narrative. Much had been learned during that hundred years and that much all went to confirm the strange story of the Florentine prisoner. The great Moorish traveller, Mohammed Ibn Batuta, followed by others as daring, had seen much of what Polo saw and returned to confirm the prison-written tale. Importers had pushed their way into these same regions and rapidly became wealthy by the trade they secured. But, alas, for poor Marco Polo. The story he told proved to be his undoing. His fellow-citizens stamped him as the most incorrigible liar that ever set foot in a Venetian gondola. Not until he was long dead did people begin to believe him. He was nicknamed "Marco Millioni," meaning Mark the thousand-fold liar. The court that faced his home bore, for generations, the uncomplimentary title of "Corte del Millioni," or place of the superb liar. Long after his death Venetian comedians appeared upon the stage under the name of "Marco Millioni" and amused the crowds with Munchausen stories. By a freak of fate, if not by design, the site of his home is now occupied by the Malibran Theatre. It is within five hundred feet of the well-known Rialto.

In order to follow Columbus during the many trying years of his sojourn in Spain, and in order to get some idea of the part played by the Spanish in the evolution

of medical science, we spent five strenuous weeks of unbroken travel in the land of the Cid. We entered Spain from France by way of San Sebastian. We intended turning aside at Bayonne in order to visit the celebrated shrine at Lourdes, but being behind in our itinerary had to abandon the idea. This remnant of the dark ages, existing near the border of Spain, would have made a fitting contrast to the better elements of Spanish medical practice. While we missed Lourdes we did not miss Burgos or Monserrat. Burgos has a cathedral that transcends the power of my pen to describe. Its architectural beauty has been referred to as the perfection of petrified religion. Its wealth of polished and carved woods and precious stones is worth more than a king's ransom. its beauty is the very best of an age of architectural beauty. Its altars, its chapels, its cloisters, are sadly disfigured by a needless display of votive offerings that tell of abject medical superstition on the part of the people. Every available spot is hung over with beads, crosses, scapulars, and wax images of maimed and distorted hands, feet, fingers, toes, heads, legs, bodies, etc. The entire human anatomy seems to be represented in dissected sections. These were hung up by the ailing, or their friends, under the delusive hope that the saint to whom the spot is dedicated will cure them of the ailment of which the offering is a symbol. After seeing these we could no longer wonder at the adoration of the average Spaniard for that prince of hypocrites, his "all adorable, wonderful, most excellent, grandest, most magnificent champion"—the Cid. It takes ignorance to see great qualities in such a character. As Burgos was the home of the Cid we visited the place where he was buried. The climb gave us an excellent appetite for our dinners, but this first dinner in interior Spain will long be remembered. We could eat nothing that was placed before us. Everything *looked* appetizing. There was fish, flesh, fowl, eggs, potatoes and pastry in abundance. The

bread was like sailor's "hard-tack" and sour. Every article placed before us was flavored with a nauseous combination of garlic and olive oil. Every tourist has this to face whenever he leaves the frontier cities or the capital. We asked for butter and a tin can of the article was laid before us. About fifty per cent of its weight was salt and it looked like so much axle grease. Our host tried every

MEDICAL HOSPITAL, TOLEDO.

conceivable way to please us, but we were not Spaniards and could not enjoy Spanish cooking. As Spaniards never eat butter the sole supply is the canned article, that is imported from Denmark for the special benefit of foreigners like ourselves.

As in Burgos, so also on Monserrat, we found a cathedral that was a veritable museum of wax models of deformed limbs, rosaries, pieces of garments, and other votive offerings of the sick. For ages this has been the rendevouz of kings, queens, princes, dons, and of the general public, when in search of health and religious consolation. Offerings of many kinds are made here to the image of Muestra Senora de Monserrat. There probably is not on the whole earth another spot of equal size that

possesses so varied a series of attractions for an intelligent tourist. The mountain, like that of Fusiyama, in Japan, dominates the scenery for many miles of country, because of its lonely majesty. Its weather-beaten crags have no equal for weird, grotesque nature-sculpture. This, the Mountain of the Holy Grail, is a most fitting place for a religious romance like that of Parsifal. There is woven around it such a wealth of legend, and fascinating history, that one could spend months in studying it all. Its paths, monuments, ecclesiastical buidings, rich verdure, immense, highly colored precipices, deep gorges, and strangely costumed monks, make it well worth a long journey to see. As the funicular railway slowly lifts the tourist toward the monastery and as he looks far down to the valley below, he is reminded very much of the view of the Grand Canon of the Colorado from Hance's Trail. Within sight of the monastery is the cavern in which Ignatius Loyola spent nearly a year of self-abnegation preparing himself for his misson of founding the Society of Jesus, now better known as the order of Jesuits. In front of the image of the virgin, in the chapel of the monastery, he made his vow of consecration. It was his priests who, in later years, gave to the world its first organic specific remedy against disease. They were the first white men—and perhaps the first human beings—to cure malarial fever. They supplied to the Countess of Cinchon the bark that cured her of an attack of this disease. It now bears her name because she had the first supply of it sent to Europe. For generations before quinine had been extracted from it the popular name was Jesuits' bark or Jesuits' powder. The Jesuit priests imported great quantities of it to Europe, charged large prices for it, and helped maintain their foreign missions thereby. The medical profession fought against its use The Paris faculty, and professors of therapeutics generally, heaped all the abuse upon it that they could. As late as 1792, Dr. Kanold, a leading physician of Breslau,

permitted himself to die of a pernicious quartant fever, declaring the while that he would rather die than use the "quack" drug. Such independent reasoners as Sydenham, Peyer, Albertini, and Torti, refused to follow the lead of conservatives, and so tried it. But for these men the profession would soon have been disgraced. The ostracised Paracelsus did not hesitate in advising his followers to try it. But for the dogged determination of this man we would have had no laudunum for pain and no mercury for syphilis. He taught in Basle, Switzerland.

Here we are reminded that the introduction of syphilis into Europe seems to have occurred soon after the discovery of America and may have been brought by the Spanish sailors. What knowledge of disease we may have acquired from this malady we should, probably, credit to Spain.

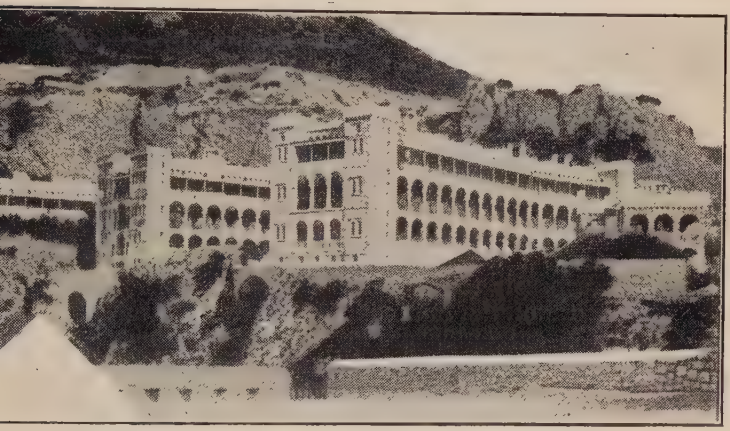
Monserrat is not far from Barcelona, a beautifully situated city on the shore of the Mediterranean, where every well-to-do citizen vies with every other in the outside decorations of his home. No other city can compare with this for fancifully carved and scene-painted fronts. Money we spend on interior decorations here seems to be spent most lavishly on the outsides of their houses. It was here where Ferdinand and Isabella gave Columbus his royal reception on his return from his first voyage. On the route from San Sebastian to Barcelona there are two points of historic interest to medical tourists. These are Tudela, the birth-place of Michael Servetus and Saragossa, where he acquired his early collegiate education. Later in life he graduated in medicine at Paris where he afterwards succeeded his teacher, the great Vaselius, when the latter removed to Padua. While acting as demonstrator of anatomy his anti-Galenical views and his theological views got him into trouble with the rest of the faculty so that he had to quit Paris. He then practiced his profession, first in Avignon and then in Charlieu. While in Paris he became acquainted with Calvin, the world renowned

theologian. They discussed together questions of religion. While Calvin was at his home in Geneva he and Servetus corresponded together. It was these letters to Calvin that fixed the authorship of "Christainismi Restitutio" upon Servetus. Being caught while on a visit to Geneva, he had to stand trial for heresy, was found guilty, and, on refusing to recant, was burnt at the stake as a heretic. He escaped from the inquisitors of Catholic Spain to suffer death at the hands of the inquisitors of Protestant Switzerland. The blue waters of the beautiful lake of Geneva received his ashes while the smoke from his burning body was wafted toward the snow-capped summit of Mont Blanc. What a horrid sight with which to desecrate so lovely a spot. They asked him to pray: "Jesus thou eternal son of God." He showed his stubborn will in behalf of what he believed to be truth and to the last repeated: "Jesus thou son of the eternal God." Because of the difference in meaning between these two brief sentences he was condemned to die a death that only a savage could devise. The difference is so subtle that many are unable to grasp it. But to the medical man the volume that brought him to the stake is of peculiar interest. It contained the earliest, non-Grecian statement of the circulation of the blood. It lacked the perfection which Harvey gave to that doctrine, at a later date, but it was a wonderful anticipation of the same. As Servetus died in 1553 and Harvey was not born until 1578 the relationship is apparent. Our double interest in Servetus as philosoper and medical man determined us to make a stop at Saragossa. The Spanish pronounce it Thar-Agatha, and it is a corruption of Ceaser-Agustus for whom it was formerly named. We happened there at the "fiesta" of the "Virgin del Pilar." The city was crowded with pilgrims dressed in the most fantastic of holiday attire. Strange shaped hats, many-colored mantillas, immense leather belts, jewelry that a Hindoo would have envied, stilletas innumerable, and

donkeys of many sizes appeared everywhere. Until we saw those costumes we deemed stage representations! of Spanish life exaggerations. Now we know they are not. Many a Sancho Panza could be seen riding his donkey among the crowd with here and there a Don Quixote on horseback. In the latter the saddles, bridles, stirrups, and spurs, were fearfully and wonderfully made. A rich lady's trousseau could scarcely display more expensive work. We visited the del Pilar Cathedral and were guided through its chapels and aisles by one of its priests. The edifice is believed to be built on the exact spot where, about 1900 years ago, the Virgin Mary appeared to St. James. The pillar on which she stood occupies the center of the cathedral, and is polished and worn into a most fantastic shape by the lips of many centuries of kissers. An image of the Virgin now surmounts this pillar and to it the multitude appeal for intercession with Christ and for relief from disease. As we pushed our way among priests, nuns, boys, girls, men, and women all devoutly praying with uplifted hands, or crossing their bodies in the interimssions, we felt almost as if we were guilty of sacrilege and frequently hesitated to proceed. Our priest-guide had no such compunction of conscience and so hurried us along. On gaining the street we saw numerous bevies of "Spain's dark daughters" who did credit to Byron's description of them in Childe Harold. We stood where the Maid of Saragossa, "Hung so fiercely on the flying Gaul, foiled by a woman's hand before a battered wall." When her lover was shot she seized his rifle and re-encouraged the 220 daring men just as they were going to fly. She shamed them into courage and that day they beat back 18,000 French soldiers. Byron has depicted it. From here we proceded to the interior of the town. There we saw the historic spot which inspired Verdi to compose his "Il Trovatore" and nearby was the Castle of the Giants that took us back in memory to our nursery tale of Jack the

Giant Killer. There, carved in solid stone, are huge images of the very giants that adorned the pages of our story book.

On leaving Saragossa, as on two other occasions, we experienced the inconveniences of Spanish methods of conducting railways. It is a rare thing for an express to travel by daylight and only happens when the distance gone requires more than twelve hours. They are usually corridor sleeping cars. Unless the passenger secures his berth a day in advance none can be bought. Every



MILITARY HOSPITAL, GIBRALTAR.

berth is, as a rule, occupied. The company will not put on a car which they are not morally certain will be full. At any way stations and crossings the would-be passenger finds the train in which he hoped to proceed, with every car labelled, "Complete." He must either telegraph to the starting station and secure a through berth for the next night, or he must take a slow day train in the morning. If he telegraphs he must pay for the entire distance that the train goes, Some few express trains carry day coaches, and if they are not labelled, "Complete," he can secure a seat in one of these by paying a supplemental fare. These trains are denominated "Rapide," although they never

exceed 35 miles per hour. Only first-class tickets, plus a supplementary fare, will be accepted. All time tables give the times of trains on the twenty-four hour day. Strangers must learn what is meant by 18.35 or 19.24 o'clock in order to know when to catch a train. Only sleeping cars have accommodations, like toilets, and as other trains are slow with, sometimes, great distances between stations, and stops of only about five minutes, it is easy to imagine the condition. If one tries to reach a point other than Madrid, except by going through Madrid, he will find that the long way around is always the quickest way across. No short-cuts are possible on Spanish railways except at the cost of an enormous loss of time. We were compelled to visit Madrid six tims when once should have been enough. It was there that we saw the barbarous, stupid, cruel sport—the bull fight. It is not a sport that requires skill, and when a man is gored it is due to his being off his guard by becoming absent-minded. Horses are gored purposely to excite the stupid crowd. Every move of the bull can be foreseen by any intelligent onlooker. The present queen of Spain does well to discourage such sport(?). We saw her and the king at short range, as their carriage passed near us on a street near the palace. She looks like a very intelligent young woman. The king looks bright but is small in stature so that his appearance is very boyish.

Our visit to Salamanaca was made from Madrid, by way of Medina. The last named place is where Queen Isabella is buried and as it is a junction we had to spend the night there, so that in that way we had a fair opportunity of seeing the girl-home of Isabella, and her last resting place. In order to save a day it was necessary to bribe a railway conductor to let us ride on a box, in the corridor of a "complete" train for a distance of about forty miles. He positively refused to look at any small amount, but finally yielded when he saw the value of five American dollars. To have missed that train would

have spoiled our visit to Salamanaca and endangered us of losing an all-night ticket for a sleeper on another line, which we had secured before leaving Madrid. From Medina to Salamanaca is within the ancient Roman province of Lucitania. Madrid, Barcelona, and most other points we visited, are within that of Iberia. On reaching Salamanaca, and wandering through its quaint streets we found it hard to realize that this was a city long before the Christian era. It still shows signs of early Greek connections. Hannibal captured it in 217 B. C. It has had Roman, Goth, Saracen and Christian masters. While in possession of the Moors its University was started and the liberal views that then obtained held it back from the wild fanaticism of the inquisitors. Ferdinand and Isabella asked that the university professors give Columbus a hearing to decide on the practicability of his proposed voyage. The hearing occurred in a nearby convent. He won over the most liberal of the faculty. Every argument that he presented, however, was met by the conservatives pointing to Ezekiel fifth chapter and fifth verse. Every medieval map of the world was made with Jerusalem in the center in order to conform to this text, and most of them had it printed on their margins. When he told them of the strange colored and strange featured men who had been cast up by the tide on the coast of the Canaries, of the strangely carved woods that had been found at the Azores, of the statements of Ptolemy, whom they pretended to accept as a guide in matters of this kind, all they did was to ask him to explain Ezekial's words: "Thus saith the Lord God; this is Jerusalem: I have set it in the midst of the nations." There was no getting around this passage without endangering one's life by the inquisitors. Columbus and his backers could only remain dumb. They dared not discredit holy writ and they could not say that it was Ezekiel's mere opinion. In vain did Columbus quote to them the remarkable and prophetic words of

Seneca, where he says: "At a distant date this ancient world will westward stretch its bounds, and then disclose beyond the main a vast, new continent, with realms of wealth and might." In logic the fight was a tie. In numbers the conservatives won, as they always do at first, and so Columbus lost.

Before leaving northern Spain we visited the Escorial, Valladolid, Tarragano, Toledo, and other points of interest. At Valladolid we saw where Columbus died, where Ferdinand and Isabella were married, and where Cervantes lived. At the other points we saw much of interest, but to enumerate them would swell this communication into undue proportions. On reaching Cordova the Moorish mosque—the finest in the world—and the many evidences of former Moorish supremacy, reminded us that this was the birth-place of that prince of Mohammedan physicians Averrhoes. Columbus, too, lived here and probably spent more time here than in other Spanish cities except Seville. Averrhoes had also lived at Seville and was for sometime cadi there. His writings, next to those of Galen, swayed the opinions of the medical men of Europe most. All other medical writers of those times took a subordinate place. Padua, that did so much for medical progress, was the seat and center of Averrhoeism. So long as Averrhoes let theology alone he was honored and respected by his Mohammedan neighbors, but as soon as he ventured into the realm of theology trouble began. The devout ones tried to get him executed, but they only succeeded in getting him degraded. He was driven out of the part of the city occupied by the faithful, had his property confiscated, and on several occasions was compelled to stand unturbaned, and with tied hands, in front of a mosque when the faithful entered to pray. It was the duty of the latter to spit upon his face, both going and coming, and the small boys were taught to pelt him with dirt and stones. Long after he was dead Erasmus spoke of him as "The impious and thrice accursed Averrhoes" Petrarch refers to him

as "A mad dog barking at the church." In Dante's Inferno he is pictured as seated in hades along with Hippocrates, Galen, and Avicenne. Most of his writings, in manuscript form, are being preserved in the library of the Escorial. If Philip II, could have foreseen this he might have ordered that building, that cost him so much, destroyed. As cadi of Seville, Averrhoes never endured the agony that came to Columbus in that city,. It was there that the latter received what was intended to be a last and complete dismissal to his suit from Ferdinand and Isabella. The junta appointed to make a final decision upon the matter definitely pronounced his scheme unworthy the further attention of their majesties. He received the message in despair. He had been held in Spain by Will o' the Wisp promises, during the best part of his life, and to be thus dismissed at last was a staggering blow. Heart-broken he and his little son, Diego, started on foot, for the home of his brother-in-law, at Huelva, fully determined to sail from there to France and leave Spain forever. Tired, hungry, and thirsty they reached the monastery of Santa Maria de Rabida, where they waited for some passing boatman to row them over the Tinta River to Huelva. Columbus begged some bread and water for his boy from one of the monks, and while it was being eaten the prior happened to pass and engaged in conversation with the father. Naturally the conversation turned on where Columbus was going and why he was about to leave Spain. As soon as the prior had taken in the situation he sent to the nearby town of Palos for Dr. Garcia Fernindaz, the scientific man of the place, and Martin Alonzo Pinzon, the richest merchant of the region. As soon as they reached the monastery Columbus again recited his story, gave his theory and the facts he had to substantiate it, after which it was thoroughly discussed by those present. Dr. Fernindaz, seeing the force of the evidence, was an immediate convert and the others promptly accepted his conclusion.

Fray Juan Perez de Marchena, the prior, immediately despatched a messenger to Queen Isabella, at Santa Fe, begging an audience with her. As her former father-confessor he felt confident that she would grant it and so he detained Columbus at the monastery till he heard from her. She ordered him to come to her immediately. There he pleaded Columbus' case with her and took back an invitation for Columbus to repair at once to Santa Fe and see her. Even then things did not move unruffled at the royal hearing. The courtiers interfered, on the plea that too much was being asked as a reward in case of success. Finally, however, the matter was settled in favor of Columbus. The Queen offered to pledge her jewels to defray part of the expenses but the treasurer of the exchequer relieved her of having to do so by assuring her that there was enough left, over the war expense, to defray the royal share of the cost of the expedition. Martin Alonzo Pinzon, personally paid for the fitting out of one of the ships and accompanied it as captain. But what a world of trouble they had in securing sailors. It finally became necessary to resort to conscription and compel enough sailors to go. Amid the tears and pleadings of mothers, sisters, and sweethearts they were forced on board by soldiers, after taking the sacrament, and receiving the blessing of the priest, at the Chapel, in Palos. From the Port of Palos, the Santa Maria, Pinta, and Nina, sailed past the monastery of Santa Maria de Rabida, into the Gulf of Cadiz. From the window of the monastery there is an extensive view off into the gulf and from there the Prior, the monks, and Dr. Fernindaz watched the three ships until they had disappeared beyond the horizon. As we looked out of the same window, over 400 years later, we wondered what would have been the condition of the earth, at present, if those three little mites of vessels had perished on their voyage. On what frail threads momentous issues hang. Although most of the romance, pathos, poetry, and prophecy of American

greatness hangs over this little hill on the sea-shore few are the Americans who do it the grace of a visit. All they seem to think of is Granada and the Alhambra, the Escorial, and the bull fights. On its summit now stands a large monument to Colon (Columbus) that can be seen for many miles in every direction. Whether the visitor goes thither by sea or by land it is the first thing he sees on passing the horizon, or on leaving the mountains. It seems to beckon to every American and ask him, if only as a duty, that he come and pay his respects to that place which, next to his own home, should be the most important spot in all the world to him. In Palos he will find the same church and the same altar before which Columbus and his crew knelt to receive the benediction of the priest. The wharf is gone, commerce has gone, and the population has shrivelled into barely four hundred, but its influence must forever remain to bless mankind. We saw Granada, we saw the Alhamba, and all the beautiful things there, which Washington Irving's pen-pictures have immortalized, but would far rather have missed seeing them than have missed our visit to Palos and de Rabida. As a small boy at school I had learned to recite the Spanish Champion, and so knew something about the Cid, but Burgos failed to impress us as being any more romatic on account of it. Not so, however, was the effect of our school days lesson concerning hungry little Diego and the good monk who gave him bread and water. The monastery door, where Columbus stopped and knocked, seemed like an old friend to me, although I had never been there before. The grounds around the monastery are now laid out in beautiful garden plots and date palms decorate the central walk. While we were there these hung laden with immense bunches of yellow fruit that added materially to the beauty of the spot. The main room of the monastery, on its upper floor, is hung with historic pictures of interest to Americans. The first shows Col-

umbus in Palos. Provisions are being loaded upon his ships. He is bidding his friends good-bye. Women are weeping over their departing sailor lads. The second shows Columbus discussing his plans within the room where the pictures are hung. Pinzon, the Prior, and Dr. Fernindaz are appealing to a lot of visitors for financial aid to assure the success of the project. The third shows the ships passing de Rabida. On a small boat at the shore Columbus and the Prior are bidding each other good-bye. Columbus is kissing the hand of the Prior. The Fourth shows the first conference of Columbus with Pinzon, Fernindaz, and the Prior, in that room. Diego sits on a chair behind his father and two monks are looking out of the window toward the sea. The fifth shows Columbus and Diego at the monastery gate. The boy is eating the bread that has been given to him. Columbus and the Prior are to the left of the entrance and near the little shrine. The other pictures are chiefly portraits of the actors in these scenes and of the king and queen. From de Rabida we made our way to Gibraltar, via Huelva, Seville, Cadiz, and Tangier, seeing on the way, among other things, the Quemadera where the two fanatical friends, Ximenes and Torquemada, burnt 298 heretics after confiscating their property; where Ferdinand Magellan started on the first fleet the remnant of which circumnavigated the earth; where, by the order of Francisco Bobadilla, Columbus was landed, in chains, after being deported from the West Indies; where the Invincible Armada, of Philip II, started with the intent of conquering England; and Trafalgar Bay where Lord Nelson won his victory over France.

GALLIA TRANSALPINA.

To a vast majority of tourists from America a visit to Transalpine Gaul is the ideal summer excursion, but force of habit and the advertising influences of those interested in personally conducted tours, in which the rates must appear to be low while the profits are substantial, have diverted the stream of travel into a few definite places. Not to have seen Paris, Brussels, Cologne, the Rhine, Gallic Switzerland, and the Riviera has come to mean not to have seen what is popularly considered the best of Europe. So completely has this narrow view come to dominate the opinions of our traveling countrymen that they are constantly overlooking many other equally interesting places in and near to France. Paris, of course, is the Mecca of all transatlantic tourists who take their first trip to that region. But what can we say regarding those who go there again and again yet learn nothing of quaint Normandy nor of equally interesting Brittany. Mont Saint Michel, the most romantic looking, and one of the most interesting places to visit that Europe affords, has no place in their geographic knowledge. Even in name, Andorra, the queerest little republic on our planet, that in its history of over a millenium has seen all of the great nations of Europe and America come into being, is unknown, though nestling within easy reach, in the heart of the Pyrenees. Les Eyzes and its Grottoes, that have given to science more and more definite, information about prehistoric man, than has been obtained from any other part of the earth, few have ever heard of. The Cirque de Gavarnie,

which, unfortunately, we had to eliminate from our itinerary because of reaching that part of France over a week behind our time, few Americans ever see. It is the Yosemite of Europe. There is nothing like it in Switzerland if descriptions of those who have seen it are reliable. Its magnificent cascade of 1385 feet in height dwarfs everything of the kind in the Alps. The view from the Pic de Pimene is said to excel that from Pilatus.

While we failed to see this particular beauty-spot we did not fail to visit the one part in all of France of greatest historic and ethnologic interest to Americans and, particularly, to American physicians who have the good fortune to get there. It was in South-Western France that some of the most important events connected with the birth of our nation transpired. It was in this same region that some of the fiercest struggles in behalf of civil and religious liberty occurred. It was here that Islamism received the first decisive blow—a blow from which it never recovered—when the fanatical followers of the Koran were sweeping everything before them and appeared as if destined to conquer the whole earth. They had subdued Spain, passed the Pyrenees and taken possession of all of Southern Gaul when, in A.D. 732, Charles, son of Pepin, as leader of the Franks, completely routed the army of Abdel-Rhaman and killed that Moorish chieftain not far from the town of Poitiers. So overwhelming was the victory that Charles was given the name of "Martel," meaning hammer, because he had crushed the Mohammedans as if with a hammer. Gibbon, the historian, says of this battle that "But for it perhaps the interpretation of the Korán would now be taught in the schools of Oxford, and her pupils would demonstrate to a circumcised people the sanctity and truth of the revelation of Mohammed." Following up this successful result Charles Martel continued his attacks upon the various strongholds of the Moors until, by 739,

he had driven the last of them back into Spain, consolidated the various little kingdoms of most of Transalpine Gaul, and laid the foundation for the country since known as France. In 737 he destroyed the Moorish stronghold of Maguelone and permitted the Hebrew, pagan, and peaceful Mohammedans, to build an unfortified city near the ruins. To this new city was given the name Montpelier. It is now one of the most interesting towns of South-eastern France. Its famous Place du Peyrou is one of the finest public squares in France. It occupies the highest piece of ground in the region, and one can stand there and enjoy what is, perhaps, one of the most magnificent and comprehensive scenes in any country. It embraces the distant snow-clad Alps, the picturesque rolling Cervennes, the majestic Pyrenees, the beautiful verdure-clad valley of the Rhone, and the blue waters of the Mediterranean Sea. Soon after the city was established a medical school was started, which soon became the most famous in the world. The renown which belonged to Salerno gradually faded as that of Montpelier grew. It became the single beacon light of liberal medical education for France as Padua, at a later date, did for Italy. Among its earliest students of note was Arnold de Villeneuve who, toward the close of the thirteenth century, first produced alcohol and isolated the essential oil of turpentine from pine resin. It was he, too, who first advocated the use of brandy as a remedy. He looked upon it as almost as good as the fabled elixir of life. A generation later and the same school gave us the famous author and surgeon, Guy de Chauliac. His book, "The Inventory," is one of the first really valuable surgical works ever published. He, too, gave us the first intelligent description of the symptoms of bubonic plague. When the great epidemic of this disease first overran Europe he was practicing in Avignon where he held the position of physician to Pope Clement VI. He stuck to the city

and cared for the sick when the majority of practitioners sought more comfortable quarters, and when even the friends and relatives of the ailing had deserted them. Being taken with the disease himself, he was left for dead, but revived and lived to describe his own experiences therewith. It is quite likely that he had met Petrarch, and he was in Avignon when Madonna Laura died. Attached to the medical department of the University of Montpelier is the oldest botanic garden in North central Europe. Like the still older one at Padua it was started for the purpose of letting medical students have an opportunity of seeing the plants from which the remedies they were expected to prescribe came. The fine villas around Montpelier are, to a considerable extent, occupied by consumptives who choose that as their home, because of its reputed healthfulness. It was in Montpelier that M. Auguste Compte, founder of the Positive Philosophy, that was so often confounded with the Synthetic Philosophy of Herbert Spencer, was born.

Every visitor to Montpelier, who has the time, is sure to go and see such nearby towns as Marsellies, Avignon, Toulon, and Nimes. To see the Riviera—a spot that few travellers through France fail to see—there is no better place from which to start than Marseilles, particularly if aimimg at reaching Italy. Such beauty spots, along the coast, as Cannes, Nice, Monaco, Monte Carlo, and Menton everybody has heard of and need no description, but Grasse—in several ways more attractive than all the rest—is talked less about and often overlooked. Its terraced streets and farms covered with roses, lilies, jasmines, and other beautiful and fragrant flowers, is a sight to delight every one who sees it. Almost the only crop of the region is flowers that are used in the manufacture of colognes and pomades. Our visit there, and to the other places named, lingers in our memories as evidence of the truthfulness of the saying that "a thing of beauty is a

joy forever." To describe the scenic splendor of hundreds of spots along the Mediterranean shore, from Montpelier to Menton would baffle my power. The visitors have a perfect surfeit of panoramic splendor, each view being, in its way, a repetition of that of the far-famed Corniche Road, or that seen from the tower of the church of Notre-Dame-de-la-Garde of Marsellies.

The building of Montpelier, after the destruction of Maguelone, did much for the evolution of medical science, but the indirect influences of Charles Martel's success in other directions did much more. His example led Christian Spain into rebellion against Mohammedan rule so that, step by step, they were able to regain their freedom. Boabdil, the last Moorish ruler in Spain, was conquered by the soldiers of Ferdinand and Isabella just before the signing of the commission of Christopher Columbus and, indeed, their signature to that document was dependent on that victory. As the young Moorish king looked from the Alhambra hill, for the last time, on the beautiful and rich country that he had lost, tears welled into his eyes. His stern mother turned to him and said: "Weep not like a woman for what you could not defend like a man." Little did she know of the fact that those tears presaged the discovery of a new world for man, or that Charles Martel, many years before, had started the train of events which made possible such tears and equally possible the discovery, at that time, of America. But still other events of equal importance came from Charles Martel's conquests. In his German fatherland he aided St. Willibrod and St. Boniface in their efforts at converting the pagan inhabitants to Christianity. He protected them with his soldiers and supplied them funds to help on their work. In 741 the Lombards threatened to besiege Rome and through his influence this danger was averted. After his death his son Pepin, through the abdication of his

PARIS. — Institut Pasteur, Rue Dutot

brother who entered a monastery, became sole prince of the Franks. In 741 Pope Zachary, as a return of favors, made him king of the Franks. Soon after Pope Zachary died and Pope Stephen came into power. Then the Lombards again threatened the head of the church with their vengeance and King Pepin was called upon for help. He sent an army to Italy, beat the Lombards, and compelled them to give to the church, as a perpetual heritage, the duchy of Rome and a number of Italian cities, near Rome. Thus started the so-called temporal power of the Pope. When Pepin died his son, Charles, came into power. By pursuing some of the methods of his grandfather, Charles Martel, he increasd the size of his kingdom and came to be known as Charles the Great, and as Charlemagne. By 796 he had conquered a large part of Europe. In 799 Leo III got into trouble with the citizens of Rome and was forced, by them, to leave that city. He sought safety in France, under Charlemagne who, in 800 A.D. replaced him in power and quailed the turbulent people of the Holy City. For this favor Leo crowned him Emperor of the world, and thus established the Holy Roman Empire of which Barbarossa was the chief glory. The rest of this part of the story we have already told.

In this coronation arose the need for that spiritual army, the Knights Templars and the Knights of St. John. It nurtured the feeling that led Peter the Hermit to preach the Crusade. It led to the establishment of our universities and, indirectly, to the Renaissance. It led to our using the red cross as a sybmol for our hospitals, and a Frenchman, Adhemar, bishop of Puy, received from Pope Urban II, the first red cross of silk cloth ever worn as a symbol of the crusade. This occurred at Clermont, in Auvergne, where the Grand Council met in 1095, and where the Pope, himself, presided.

In history there occur many curious

coincidences, that though purely the result of accident are somewhat startling. One such is associated with the history of the symbolic use of the cross. Its modern adoption dates from the International Congress called at Geneva, in 1863, by the Societe Genevoise, under the guidance of M. Dunant. Then the Red Cross Society was launched into active life. This brought the union which now exists between medicine and the red cross. In the whole world one can hunt in vain for four other places so intimately connected with the triumph of the cross and the triumph of medicine as Poitiers, Geneva, Paris and Montpelier. No where else in the world can one find a spot where the first symbolic cross was given by the hand of the Christian church, to be worn in the sight of all the people as a functional emblem, than at Clermont, in Auvergne, now Clermont-Ferrand. In Poitiers the cross won its first lasting triumph over the crescent. In Geneva the red cross was chosen as the symbol of mercy and human kindness for the wounded and ailing. In Paris Christian nurtured Galenican medicine had its early home. If the reader will take a map of France and with a red pencil draw a straight line from Paris to Montpelier and another similar straight line from Poitiers to Geneva, these two lines will form a nearly perfect red cross. In outline it will be very much more nearly perfect than is the so-called Southern Cross that lies near the south pole of the celestial sphere. The lines bisect each other at nearly right angles and the two arms of the cross are nearly of equal length. During ancient Roman crucifixions the heart of the one being crucified always occupied a position a little below the bisecting point of the two lines of the cross. In this historic-geographic, accidental cross Clermont lies, in relation to Poitiers and Geneva, just as would the heart of a victim of crucifixion. The act of Pope Urban II, at Clermont, was the cortical act in the dramatic history of the red cross. In touring France Clermont

is unfortunatelly for us, a spot in this curious historic picture that we failed to see.

Inasmuch as Geneva is the only place where my wife could ever be persuaded to consent to my ascending in a balloonand that only on the condition that we go together so that if one of us should be killed the other would meet the same fate, the reader can imagine, if he chooses, that the light-headedness induced by that ascent may have had something to do with my discovering such coincidences. It is therefore, probably best that no attempt be made to complete the story by adding other odd relationships that have occurred to me. If these serve the purpose of fixing in the memory the important events that connect them together they will have done their duty and my consumption of valuable space in their recital will be slightly justified. Before leaving the consideration of Geneva, however, it will be well to recall to the reader's attention that it was here that Dr. Servetus was burned at the stake for the heresies contained in a book that treated imperfectly of the circulation of the blood, about a century before the time of Harvey. It was at Dole, a small village near here, in which Pasteur was born, and about midway between here and Clermont, in Villefranche, that Claude Bernard, the great pathologist and anatomist, was born. As Geneva is the most common entrance to Switzerland, by tourists coming directly from Paris, it will be well to advise all who anticipate taking such a trip to study a history of Geneva in advance, for no where else has so much of literary, scientific, and historic interest been concentrated. Scarcely a great name of the past half millenium can be found whose bearer has not spent some time in this remarkable city. The beauty of its situation is common knowledge and needs no repetition at this time.

Returning once more to the consideration of Western France, from which our historic narrative carried us, we will take a hasty

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glance at the chief points of interest that were visited, learn what connections they had with the evolution of medical science, and see something of the people and their ways. In taking that part of our tour we entered France, from England, by way of Southampton, the Channel Islands, and St. Malo. We visited Mont St. Michel to see its strangely placed abbey, perched on the summit of the huge, conical rock where houses cling all around the sides and base, and to see its wonderful tide that, when rising, rushes over many miles of sandy-beach faster than a horse can run. We saw the curious St. Servan bridge, on stilts, that carries passengers across the bay as would a ferry boat. We watched the near-by bathers, and the public "Baigneurs," who are all men, caring for the ladies, who venture into deep water, and teaching them how to swim. We interested ourselves in the "Octroi" and their methods of collecting taxes on all sorts of goods that are carried into the cities for sale. In the United States we "kick" at our customs officers who go through our luggage whenever we return from a foreign land. In France they make the entrance to every town and city a port of entry, and overhaul even the cabbage and turnips of country farmers, compelling them to pay duty on every such article they carry, whether on a wagon or in a basket. No matter how small the basket happens to be, or whether it is carried by man, woman, or child, its contents are carefully scrutinized and a tax levied. We observed that all trolley cars had two conductors. One sells the passenger a ticket and the other cancels it with a punch. On railway trains there are no conductors. The passenger buys his ticket in the station, a gateman punches it as he passes to his train, and a second gateman collects it when he reaches his destination and leaves the train. There is no one to look after passengers to tell them when to leave their train. Before trains start a deep toned bell is struck a number

of times, at slow intervals, which exactly resembles the ringing of a church bell for a funeral. Then there follows a squeaky sound from the train starter's bugle or whistle, whichever he happens to have. Following this the engine whistle blows and after that its bell rings and the train starts. No baggage checks are supplied so that owners of trunks have to be taken at their word when they point out those that belong to them and they are put to the necessity of keeping their eyes in the direction of the baggage cars to see that their belongings are not, by mistake, put off at the wrong station. Americans can be told by the shape of their hand luggage for the native "grip" is usually in about the shape of our ordinary trunks, but of course in miniature. A handle on the top serves them as a means of carrying the same. Soldiers are transported in cattle cars, and numerous such cars were passed bearing the words: "36-38 Hommes,—8 Chevaux." This means that each car has been made to carry from 36 to 38 men or 8 horses. At every road crossing there was always to be seen a woman waving a flag to warn drivers of the approaching train. These women are the widows or daughters of dead soldiers, this kind of job, as well as the selling of cigars and tobacco, being reserved for their benefit, by the government. It is in tobacco stores that postage stamps, postal cards, stationery, picture postal cards, magazines, newspapers, and railway guides have to be bought. Book stores carry some of these articles but, as a rule, the handiest place to get them is from the tobacco store. All through Normandy and Brittany apple orchards cover most of the farms. Other crops grow among the apple trees. Buckwheat is very common and grows much more rank and with much redder stalks than in America. Cider is the common drink of the poeple but the article supplied at hotel tables is far from tempting. It tastes more like an inferior quality of diluted vinegar than anything else. All

around each farm in Brittany, there are willow hedges. The willows appear to be used in making baskets and various articles of furniture. In Guyenne and Gascogne poplar trees gradually replace the willows as hedges. Both oxen and cows haul the farm carts and drag the plows. They are often seen hitched together. Most of the villages and country places in Brittany looked very strange to us, and the larger they were the more pronounced was their oddity. Instead of having small chimneys on the roof, as in our houses, the entire gable end of the house ascended, as a chimney, above the roof. Instead of slate or shingles, as coverings for the roof, some had red tiles, some thatch, and a large proportion of them slaty shale, in blocks about half an inch thick. Most of them had what appeared to be sashless panes of glass—single panes—fastened into the roofs. One of the most curious of all the curious sights, was the bread. It is a common thing to see women carrying to their homes, from some nearby bakery, loaves of bread fully two and a half feet long, one foot wide, and six inches thick. The crust on such bread is so hard that it tests the quality of the teeth and jaws of the users. Bakers supply many sizes, but purchasers appear to buy those that correspond with the number of consumers in the families. Whenever a funeral passes it is customary for all men to take off their hats and all women to cross themselves and say a prayer. In small towns this is not as noticeable as it is in large cities, like Nantes, Bordeaux, or Marseilles. There the streets are crowded, and when a great multitude simultaneously uncover their heads it is instantly observable. The mourning costumes of the women differ from those of America in the oddity of shape of the hats and the immense length, width, and foldings of the black sashes. The dresses can scarcely be seen, particularly from the rear, because of the size of the crape additions. Although flowers are

abundant, and much more beautiful than those supplied by florists in New York or Chicago, they decorate their tombs with painted metal imitations of flowers that, to me, look repulsive and unnatural. Most of the peasant women wear caps of immaculate whiteness, no matter what may happen to be the color of their other garments. The fronts of the caps are heavily fluted in white. Mourners use black fluting on the white caps.

The towns we visited were such as contained places of historic interest. Art, landscape, and architecture were of secondary importance. Rennes interested us as the early home of Descartes, Nantes as the place where Laennec, the invenor of the stethoscope, and Bichat had been students, La Rochelle as the place where Seignette first produced Rochelle salt, Bordeaux as the birth-place of Magendie, and Bayonne as where the bayonet was first produced. At La Rochelle we did not forget the wars of the Huguenots for freedom there, nor at Bordeaux did we lose sight of the fact that Benjamin Franklin landed at that port when on the most momentous mission of his life. We likewise recalled it was from there that Lafayette, at much risk, secured the ships he required to help America in its fight for freedom, and that near there is the present home of the exiled Acadians whom Longfellow's Evangeline has immortalized. At Bayonne who could forget that it was there where the two fiends, Catherine de Medici and the Duke of Alba, planned the horrors of St. Bartholomew's day? What a time of darkness and spot of moral blackness that day brought upon Paris! Medical science then came near losing one of its greatest sons. The chief object of Catherine's hate was Gaspard de Coligny, admiral of France, and a Huguenot. When the massacre occurred he was marked as the first to be sacrificed. They had even tried to kill him two days before, but only wounded him. The night of the massacre Ambrose Pare, one of the most important

individuals in the evolution of surgical science, was with him attending to his wounds. Pare was also a Huguenot Protestant. Coligny had long been aware of the intended massacre. To those present he said: "I have long been ready to die, but you, my friends, save yourselves, if it is still possible." As Pare still hesitated to leave his patient, the old admiral, urgently insisted upon his going. They heard the commotion and noise of the approaching crowd of murderers and the firing in the court-yard made them certain of what was about to happen. But for the intervention of Charles IX Ambrose Pare would still have met the fate of the other Huguenots of Paris, but the king had so much faith in his surgeon that he spared his life. He tried to force Pare to become a Catholic as a condition of saving his life, but the latter was stubborn and the former let him escape. The entire life of Pare is a most remarkable one. He, a mere barber, had, for many years to fight the whole medical profession. He took up surgery with his barber work, as was the habit of his time, and in order to advance himself in such work attended clinics at Hotel Dieu, Paris. Getting a position as surgeon-barber in the army he studied faithfully the methods then in vogue for the treatment of wounds. On one occasion the boiling oil gave out that it was the habit of the army surgeons, of those times, to use in every wound before bandaging it. He noticed that those whose wounds were not treated to boiling oil survived in far greater numbers than those on whom the oil was applied. When the surgeons were told of this they first made fun of him, and then denounced him as a quack and a fool. He persisted in fighting them and—naturally—those officers who happened to be wounded preferred Pare's method of treatment, as it was much less painful. His results told and he became the favorite surgeon of the army. His next great discovery was that of saving the lives of those with severed arteries, of large

calibre, by ligating them. This led to amputations of hopelessly wounded large limbs. To us, today, the opposition which he met from the profession, because of this discovery, seems like sheer insanity. He was denounced as being conceited for pretending to know more than all the rest of the profession. This, by the way, has always been a favorite missile to hurl at independent thinkers. It is not deemed conceit to fight the ignorance of one doctor, but it becomes serious conceit to fight the ignorance of all doctors. To all new knowledge there must be a beginning and much of it must conflict with tradition. One man must first observe this conflict. There may be many better posted and brighter men than he is, but their enthrallment blinds them to the new truth, and very frequently they are the blindest of the blind. Men who honestly desire truth either investigate the new claims or keep still. Bigots scoff, call names, denounce, and condemn. Honest criticism of a new idea is beneficial, but dogmatic condemnation is, by the ethical standard of nature, vicious and criminal. The worst foe of the human family is the man who dogmatically denounces even a genuine crank. If facts cannot prove his crankiness then no honest man is going to hurl invective at him and then refuse to give him an equal hearing. Ambrose Pare was a medical and a religious heretic, but we are now all ready to bless him for both phases of his heresy and then—well—some of us go ahead and imitate Catherine de Medici as far as we dare.

Paris—purged Paris—is far more liberal than she was. There are fewer of the stripe of that de Medici there now. Paris doctors, long steeped in senseless conservatism, have now a larger sprinkling of men who are not afraid of new thoughts whether true or false. They no longer drive their Vesalius's to Italy, nor give over their Servetus's to the stake. They have more men like Rene Descartes who, diplomatically, seek to promote truth without court-

ing martyrdom. He had the courage to defend Harvey, to teach evolution, to devote his life to the promotion of scientific physiology, and yet he was trained and raised as a Jesuit. His "cogito ergo sum" is still the despair of materialism—a pithy statement of fact that no opponent has ever been able to refute. He helped bridge the great chasm between past and present ways of thinking in both medicine and philosophy. His body, like that of Columbus, has been tossed about by the exigencies of politics, but the black marble tablet, in the church of St. Germain-des-pris, that marks his last resting-place, should be visited by medical tourists who hold in respect the great men who have helped create modern medical science.

There are a good many such spots in Paris. In the court of the Ecole de Medicine is a bronze statue in memory of Bichat that they should see. He was known as "The Napoleon of Medicine," and his "Anatomie general" laid the foundation stones of scientific pathology. He first differentiated and named the various tissues of the body, first taught us the meaning of respiration, first classified our organs in relation to their functions, and first taught us how to distinguish pleurisy, pneumonia and bronchitis from one another. A second monument to this great physician is found in the Pantheon, that stands on the site of the old tomb of St. Genevieve, the patron saint of Paris. There, too, are monuments to Descartes, the physiologist and philosopher; to Lafayette, who did so much for the United States; to Laplace, the astronomer and evolutionist; to Berthelot, the chemist; and to many other of France's great sons. In the Rue des Ecoles, facing the College of France, can be found a bronze statue to the memory of Claude Bernard, the man who, along with Brown-Sequard, taught us the function of the thyroid gland and who discovered the glycogenic function of the liver. He was the assistant and successor of another French-

man, Magendie, Professor of General Pathology in the College of France. The name of Magendie is familar to most physicians through his solution of morphine, but he owes his reputation for greatness to much more than this. He was the pioneer experimenter in pharmaco-dynamics, and to him we owe the use of the alkalies as therapeutic agents. He too first coined the words "pyemia" and "metastasis" as terms of pathology. On the Chemin du Dragon, in the Cemetery of Pere-La-Chaise—the principal cemetery of Paris—can be found the tomb and handsome medallion that marks the last resting-place of Geoffery St. Hilare, the great naturalist, and Member of the Academy. Around where he lies are hundreds of tombs of great painters, authors, sculptors and statesmen, but none of them ever did as much for the advancement of man as he did. As a link in the chain of mental progress he made Darwin possible and even anticipated the mutation theory of De Vries. His "Philosophie Anatomique" was greatly admired by Goethe because of its evolutionary ideas. He was the colleague of the famous Lamarck whose theory of evolution by acquired characters is today one of the burning questions of biology. Both St. Hilaire and Lamarck studied medicine but turned their attentions to science, and both were so unfortunate as to spend the last days of their lives in blindness. Both held positions in the Jardin des Plantes, one of the most interesting spots in Paris for a stranger to visit. To Lamarck we are indebted for the word "biology" as applied to the science of living things. Competent authors speak of him as the most prominent figure between Aristotle and Darwin. While this may apply to Lamarck as a naturalist, when viewed by naturalists, he can occupy no such position from the standpoint of medicine. If we pass Darwin and come a few years nearer to our own time, the one man who looms up above all others and who, in some respects matches even

Darwin, is Louis Pasteur. He revolutionized medicine as no man ever did before him. The Pasteur Institute, as a monument to his memory, and the international subscription monument, at the Place de Breteuil, are evidences of the impression he has made on this generation, but it is the firm conviction of this writer that a century from now he will be reverenced even more than he is today. Without his work we never could have discovered the etiology of disease as we know it now. To the masses he is known as the man who taught us how to overcome rabies, but to the well posted physician he is the man who taught us how to know the causes of all kinds of diseases and who put us on the path that is leading us into the knowledge of how to cure diseases. Aided by Davaine's discovery of the anthrax bacillus, Chaveau's discovery of artificial immunity, and Calmette and Roux's many discoveries concerning the mechanism of immunity, Pasteur, and the Pasteur Institute, have done more for suffering humanity than is generally known. Much—very much—has been done in Germany, but that is another story.

Nor has the good work of the Pasteur Institute come to an end. It is still going on under the leadership of another great discoverer, Metchnikoff. His chief discovery, however, and one that will be remembered for all time, is the phagocytic function of the leucocytes. On this discovery hangs the true explanation of acquired immunity. It reveals the fact that our cells fight disease in almost exactly the same way as our stomachs or duodenums digest our food. Indeed, by inference, it seems to indicate that digestion is as much of a protective measure as it is a means of nutrition. The existence of these fighting cells shows us that the struggle for existence and the survival of the fit began with monocellular life, kept up through the lowest forms of polycellular life, and has never, to this day, ceased.

The great battle for existence at all

times has been within, rather than without, the animal's body. The forms that have survived must have chiefly been the forms that were able to meet and defeat the invisible, more often than the visible foes. Metchnikoff made his great discovery at the ill-fated city of Messina, in Sicily. When this series of papers was begun, the reader will recall that we started from Catania, a city within a few miles of Messina, and that we had just arrived there from Messina. It was in the waters between Messina and Catania that Metchnikoff secured his research material that led him to the discovery of phagocytosis. So novel was this idea of fighting cells that there was no particular inherited theory to oppose against it. One would hardly have expected it to be vigorously opposed unless facts were really against it. The conservative habit of fighting everything new, merely because it is new, is so strong a trait among some men that, without waiting for facts, it was at once assailed, and by the very men who should have been the first to espouse it. Prof. Ziegler and his pupils went against it with all their might in spite of the fact that it was from Ziegler's book that Metchnikoff got most of the facts which he used in strengthening his own interpretation of the things he had observed. It was not long, however, before many other observers saw the things that Metchnikoff was the first to see and he was thoroughly vindicated.

BRITANNIA.

Much of what Greece was to the development of ancient medicine Britain is to modern medicine. Were it not for the fact that to Germany we chiefly owe the careful, accurate working out of the data of cytology and pathology Britain's preeminence would be undeniable. As it is we owe to the latter the elucidation of the great principles of that biology which includes, as part of itself, Germany's contributions to cytology and pathology. The temple of modern medical truth has been built from the plans of British architects, but the hard work of its construction has been done mostly in Germany, though a large part of it must be credited to France, Holland, Italy, Russia, Switzerland, the United States, and Scandinavia.

In constructing an itinerary of travel through the British Isles the medical tourist who desires to bring himself in touch with the historical associations through which these plans evolved should on no consideration fail to visit Edinburgh, Cambridge, and Oxford. All of these should be triple-starred. In order to give them a fit perspective he ought to see the places where Christianity first took root in this same part of the world. By landing at Queenstown, as this author did in a tour that preceded his periterrestrial one, the traveller will be suddenly introduced to that part of Ireland where the "brogue" is the thickest and Hibernian ways most pronounced. He will see the place from which Wm. Penn sailed for America, hear the celebrated "Sweet Bells of Shandon;" have his first ride in a "jaunting car" to Castle Blarney and get a

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chance to kiss the Blarney Stone, enjoy the justly celebrated beauty of the Lakes of Killarney, visit Dublin the modern capital of Ireland, and cross the "Boyne Water" where William of Orange defeated King James of Scotland, much to the satisfaction of the Scottish people. Soon after passing the Mourne Mountains he can stop and study the ancient capital of Ireland and stand upon the spot where the first Christian church was erected in the British Isles. Here in the ancient Dunun of Ptolemy most probably lies all that is left of the body of Saint Patrick. The place now bears the name of Downpatrick. The cathedral stands upon a hill within the town and probably occupies the site of the chapel which Ireland's saint dedicated in A.D. 432. This was about the time the Angles and Saxons invaded Albion, and later caused its name to become England. On the east window of the cathedral is an inscription in Latin which reads: "Hi in tres Duno tumulo tumulantur in uno, Brigdia, Patricius, atque Columba pius." This has been translated so as to read: "Three saints do rest upon this holy hill, St. Patrick, Bridget and St. Columbkill." Before the advent of railways the people of this region had not given up ancient methods of treatment. About a mile from the cathedral are four shallow wells that have been long known as the Wells of Struel. They have likewise been known as the Wells of Saint Patrick. For ages they have singly been known as (1) the "Body Well" or well in which acute bodily infirmities could be cured and sins removed; (2) the "Limb Well," or well in which diseased arms and legs could be healed; (3) the "Eye Well," or well in which diseases of the eyes could be subdued; (4) the "Well of Life," or well in which chronic bodily ailments could be overcome and perfect health restored. Some years ago a Protestant bought the property on which these wells are situated and instead of pursuing the American plan of making money out of credulity he has been discouraging such

superstition by making visitors a laughing-stock for himself and friends. At one time scarcely a day would pass without dozens of pious visitors being present crawling and praying in these wells. Now the occasional visitor finds a non-congenial atmosphere to freeze his faith, so that the reputation of this Irish Epidaurus is almost at an end.

By crossing Ulster, to the County Donegal, the tourist can reach the Garton Lake and visit the birth-place of St. Columbkill. Here was established the second head centre of early Christian religion. About A. D. 450 St. Patrick and St. Columbkill dedicated a chapel on a hill not far from the lake. What is claimed to be the ruin of that chapel is still standing there. Possibly the stones and the spot may be the same, but it is quite evident that even that roofless, doorless, windowless old ruin is too modern for such a claim. Anyway the people of the region are convinced of its being the original. A broken stone font lies near the remnants of an altar. Some one, as an act of devotion, seems to keep it supplied with water, and if appearances do not belie facts that altar and that water must be often used. All around these, stuck into the plasterless walls, hung on extemporized wooden pegs, placed on projecting stone ledges, and strung on suspended cords, are myriads of mementoes of the suffering and ailing. There are small crosses by the hundreds, prayer beads a basketful, scapularies by the score, rags, handkerchiefs, rings, brooches and pieces of various kinds of garments in great abundance. On one small ledge I counted more than fifty strings of prayer beads. All these are left for the devouring maw of time to eat up along with the weather worn, roofless chapel that constitutes their store-house. There is no officiating priest, no fees and but few obtruding travellers. It is so far from the currents of civilization that it stands as a well preserved vestige of premedical times.

A few miles farther on and we found

Dooan Holy Well, with a number of ailing persons drinking its water and praying on its brink. Thousands, we were told, visit it every year. All around the well are abandoned crutches, canes, and branches of shrubbery that are hung over, from top to bottom, with handkerchiefs, rags of many kinds and colors, strings of prayer beads, small metal crosses and other articles that have been made to touch the ailing at affected points and left here with a prayer after gorging with the water. As far as the eye can see there is scarcely a tree, bush, or shrub that is not decorated with such articles. In a near-by hut the tourist can buy picture postal cards of this gruesome and painfully suggestive sight. The driver of our jaunting car assured us in a most emphatic manner of the great efficacy of such treatment. He had never known of a sufferer who did not get relief unless "mortally affected." The same driver believed just as thoroughly in the existence of "wee folks," as he called the "fairies." Hindoos carry home the sacred water of the Ganges to purify their souls and renovate their sick bodies and the devout people of Donegal carry home thousands of bottles filled with Dooan water for the same purposes. This vestige of primitive simplicity, not far from the heart of modern civilization, is at once interesting and astonishing.

The third head-centre of early British Christianity is in Scotland. Before reaching it the sight-seeking tourist will visit the intervening places of historic, scenic, and scientific interest. A few miles from Garton Lake is McSwine's Gun, on the tip of land that is first seen by transatlantic travellers between New York and Glasgow. This is a cavern, with a small opening at its summit, into the mouth of which sweeps the Atlantic surf. In high winds so much water enters that it compresses the air in a manner that makes it escape from the upper opening with a roar like that of a cannon. At Londonderry the cathedral occupies the

site of another ancient chapel of St. Columbkill. This curiously walled old city stood a siege of nine months, in 1688, under the governorship of a Presbyterian minister. Those were the days when men had to fight for "life, liberty, and the pursuit of happiness," and the tales of their sufferings are most pathetic.

At the Giant's Causeway the traveller sees one of nature's greatest wonders. There nature looks as if attempting to mimic man. Acres of basaltic columns have all the appearance of having been chiselled into form by skilled stone cutters and fitted into position by trained masons. On the way to the Causeway from Portrush the tourist is carried upon the first electric railway line ever constructed on a commercial scale on our earth. From the Causeway, as he proceeds toward Larne he sees and may, if he chooses, cross on the Carrick-a-Rede swinging rope bridge that spans a chasm over the boiling surf of the Irish Sea, a hundred feet below, to a small island near the mainland. On the same route he can visit the Falls of Glengariff, the grave of Ossian, and the strangely sea-carved basaltic rocks known as "The Gobbins." On the way he passes through miles of gorse and heather-covered bog, resplendent in the beauty of solid masses of bright pink and golden yellow blossoms.

Crossing to Scotland, by way of Stranraer, he passes through the romantic country made famous by Burns' poems, visits, if he chooses, the many places described in these poems, takes a look at Loudon Castle where the representatives of the kingdoms of England and Scotland signed the agreement that gave birth to the British Empire, and then proceeds on his way to Greenock and Glasgow. On the Clyde River he sees miles of ship-yards in which are being built hundreds of monster ships destined to constitute the future navies and merchant vessels of every country in the world. Proceeding to the world-renowned Trossacks he sees in turn the home of Rob Roy

General Hospital, Birmingham.

Ellen's Isle, and the scene of the conflict between Fitz James and Rhoderic Dhu, all so beautifully described by Sir Walter Scott. On reaching Oban he takes a steamer for Iona, by way of Staffa. At Staffa he sees Fingal's Cave the only large cave of its kind in all the earth. Like the Giant's Causeway it is a mimicry of human effort, but on a colossal and, therefore, unhuman scale. It is one of the greatest natural wonders of our planet. Far into the mass of the apparently chiselled columns the surging sea has cut its way and left a cavern with fluted sides like some immense cathedral. Staffa and Iona belong to the Hebrides Islands, and are therefore part of the Ultima Thule of the ancient world. They are but a few miles apart. Iona was for ages known as "The Holy Isle" to all of Europe. To it came the sick and the sinful from remote regions to gain the consolations of religion and get cured of their ailments. Of it so great an author as Dr. Johnson wrote that, "That man is little to be envied whose patriotism would not gain force upon the plain of Marathon, or whose piety would not grow warmer among the ruins of Iona." Liberty for all the earth was at stake on the plain of Marathon and the struggling plant of early Christian faith flourished on this little island while it kept dying at every other place where planted in all the country around. The inspiration from Marathon and that from Iona has been of incalculable value to our race. Crude as we may now deem the methods of treating the sick formerly practiced in Iona, it was the purest and best upon the earth at that early epoch. So greatly beloved did the spot become that it became the chosen burial place for kings. Even Macbeth chose its sacred soil in hopes of being forgiven by murdered King Duncan, whose ashes rest near to his own.

From Iona to Edinburgh carries us from ancient to modern medicine, and from ancient to modern philosophic thought. In

journeying from one to the other the student of Scottish history will desire to stop on the way and see Stirling Castle and the field of Bannockburn. Burns has immortalized the latter in his "Scotts wha hae wi' Wallace bled." On reaching Edinburgh -- the Athens of Great Britain—its beautiful situation immediately captivates the heart. Sir David Wilkie, viewing it for the first time and critically studying it as an expert artist, wrote to his friends that "What the tour of Europe was necessary to see elsewhere, I now find congregated in this one city. Here are alike the beauties of Prague and of Salisbury; here are the romantic sights of Orvietto and of Tivoli; and here is all the magnificence of the admired bays of Genoa and of Naples. Here, indeed, to the poetic fancy may be found realized the Roman Capital and the Grecian Acropolis." But great as are its scenic beauties greater still are its romantic attractions when standing in "The Heart of Midlothian" and viewing it through the poetic eyes of Sir Walter Scott. But our study now is neither scenic nor romantic but medical. What of the additions which "Auld Reekie" has made to medical science? During two centuries the following stars of the first magnitude have, directly or indirectly, been closely attached to its university. Some of them were born there, some studied there, some graduated there and two of them received honorary degrees from there. Who among the readers of the Medical Fortnightly have failed to become familar with the names of such world-wide celebrities as Drs. Hunter, Priestly, Black, Hutton, Darwin, Dalton, Brown, Young, Bell, Bright, Duncan, Owen, Lister, and Huxley? What educated man in all the world has failed to become familiar with the names of Robert Chambers and Charles Darwin, neither of whom became doctors? William Hunter, "the first great teacher of anatomy in England," was born in Lanark Shire, near Glasgow, but spent two years at Edinburgh, taking his degree there. In

his school of anatomy in London he had among other illustrious pupils Edward Jenner, the discoverer of vaccination. Jenner made his home with Hunter, while in London, so that their tie of friendship was closer than that of teacher and pupil. John Hunter, William's youngest brother, who was also born in Scotland, received his anatomical knowledge from the latter. He became even more celebrated than William. The British Encyclopedia tells us that he is "as physiologist and surgeon combined unrivalled in the annals of medicine." He was the first person in this world to ligate a large artery for aneurism. His studies in comparative anatomy made him the precursor of Cuvier. His anatomical museum is now the property of the Royal College of Surgeons, London. The Hunter Society of Edinburgh, started in honor of him, is one of the most important societies for the advancement of comparative medical science in Great Britain. Joseph Priestly, the second in the galaxy of Edinburgh stars that is here named, is the discoverer of oxygen. He was a Birmingham man, but received the honorary degree of LL. D. from Edinburgh. He was so persecuted for religion's sake, in Birmingham, that he fled to America and ended his days in this country. The writer of this has always had a sympathetic feeling for Priestly, because he once wrote, "I saw reason to embrace what is generally called the heterodox side of almost every question." Today there stands in front of the town hall of Birmingham a large statute to the honor of this man whose home was there destroyed by a mob and he compelled to fly his country because he refused to have his intellect cut to the standard of bigots. While reading the inscription on that monument, with bared head and reverent heart, I asked myself whether the time would ever come when bigots would know themselves to be bigots and quit seeking to coerce others who are usually their mental superiors. The third great name on our list is that of Joseph Black

whose graduating thesis, written in 1752, when he was only 24 years of age, wrought a complete revolution in scientific methods. In his experiments he used a balance, and thus secured exact results. He thus laid the foundation of modern chemistry so that even Levoisier credited him with precedence. John Hutton was born in Edinburgh, but took his medical degree in Leyden. As a pioneer in geology he paved the way for Lyell. Erasmus Darwin received his M. D. in Edinburgh but returned to England to practice. As a poet and philosopher he ranked high, and his theory of evolution paved the way for that of Natural Selection, as propounded by his illustrious grandson, Charles Robert Darwin, author of the "Origin of Species." His son, the father of Charles, was also an M.D. of Edinburgh. In his description of the evolution of the human hand, through an accidental variation in the muscles, Erasmus Darwin almost anticipated the doctrine of Natural Selection. His ideas were afterwards parodied thus:

> "There was an ape in days that were earlier;
> Centuries passed and his hair became curlier;
> Centuries more and his thumb gave a twist,
> And he was a man and a positivist."

John Dalton, the propounder of the atomic theory of matter, was a Manchester man, but he received from Edinburgh the honorary degree of LL.D. The basis of his theory was the definite and reciprocal proportions in the unions of chemical substances. These could not have been discovered except by the method that Black had established. Robert Brown received his medical degree at Edinburgh. He laid the foundation on which Schwann and Nageli at a later date strengthened the cell theory of life, by discovering the nucleus in plant cells. Thomas Young, discoverer of how to read the Egyptian hieroglyphics and propounder of the undulatory theory of light, studied medicine at Edinburgh, but took his M.D. degree at Cambridge. Chas. Bell, the great physiologist and surgeon, taught surgery in Edinburgh. He was the

first person who distinguished the difference between motor and sensory nerves. As editor of Paley's Evidences of Christianity" he was indirectly connected with directing Darwin's mind toward the doctrine of Natural Selection. He was the first head of the new medical school which later became University College, London. Richard Bright, who first pointed out the relationship between dropsy and kidney disease, and for whom the latter has received the name of Bright's disease, was a graduate of Edinburgh University studying there under Dugald Stewart, Playfair, and Leslie, men almost as renowned as the ones we have named. Dr. Duncan, the man who isolated the first active medicinal principles of any plant, received his degree from Edinburgh, and was in Edinburgh when he accomplished this important work. The alkaloids thus isolated were those of cinchona. He did not however, separate the quinine from the cinchonine and other alkaloids. This was done at a later date in France. Richard Owen, the leading comparative anatomist of the nineteenth century, the founder of the Hunterian Society, and the man who first made the important distinction between analogy and homology in anatomy was a graduate of Edinburgh University. Lord Lister, founder of antispetic surgery and the prophet of cleanliness in surgical and gynecological work, was Professor of Clinical Surgery in Edinburgh University, and did his first surgical work in Edinburgh Royal Infirmary. One has only to read the records of the deaths from surgical pyemia and puerperal septicemia before the days of Lister in order to appreciate the vastness of the reformation he brought about. Thomas Henry Huxley, the St. Paul of Natural Selection, received his M.D. degree at Charing Cross Hospital, London, but Edinburgh honored him with the degree of LL.D. He was the founder of Scientific Paleontology. Robert Chambers, of the Encyclopedia of Useful Knowledge and reputed author of the anonymous "Vestiges

of Creation,"spent most of his days in Edinburgh. He was a self-taught man but an extensive writer, and no one ever did more toward popularizing scientific knowledge of every kind. The "Vestiges" was the despair of theologians. The more they condemned it the more editions of it had to be printed in order to supply the unprecedented demand. It is not likely that Darwin's Origin of Species would have leaped into the almost immediate recognition among biologists that it did had it not been preceded by Chamber's less scientific volume. It made the subject of evolution a burning one of that generation, and the biologists were called upon to refute it. Like Balaam they were asked to curse but, like Balaam, they were compelled to bless. Not suspecting Chambers as being the author of such a book strictly orthodox St. Andrews, the oldest University in Scotland, gave him the honorary degree of LL.D. for the well-known educational work that he was engaged in.

In the long list of great names of the men who have made Edinburgh famous none stands so high as that of Charles Robert Darwin, the immortal author of "The Origin of Species." Following the footsteps of his father and grandfather, he entered college there intending to graduate in Scotland, but fate ordered otherwise. He left Edinburgh, went to Cambridge and took his degree of A.B. at Christ's College, the alma mater of the author of Paradise Lost, John Milton. After graduating, his voyage as a naturalist on H.M.S. Beagle, his studies of Lyell's Geology, his reading of Paley's works on Natural Theology, and his interest in the contents of Malthus' book on the Laws of Population, directed his mind to Natural Selection as the only reasonable explanation of nature's remarkable adaptations. This law is so deeply concerned in the production of all living things that now our eyes are being opened to its vast importance in physiology, pathology, bacteriology, protozoology, pre-

ventive medicine, therapeutics and in fact every conceivable part of modern medical science. By following its indications we are discovering serums, glandular extracts, opsonins, precipitins, and hormones and learning something of how and why drugs act upon diseases. It only is able to give us the slightest idea of the meaning of phagocytosis, of bacteriolysis, and of hemolysis. As we begin to appreciate the overwhelming importance of .Darwin's theory to coming medical science we become sorry that he failed to follow in the footsteps of his father and grandfather by himself taking the medical degree even if he failed to become a medical man. He was born and reared in a medical atmosphere, and even the mother who bore and nursed him has her maiden name in everyday use in every drug store in the world. She was the daughter of the famous Wedgewood the first producer of the Wedgewood mortars with which our powders and pills are mixed, and in which our crude drugs are comminuted. But let us now follow him to the banks of the river Cam and take a look at the great university where he graduated.

After "doing" Edinburgh few will want to leave Scotland without seeing Abbotsford, the home of Sir Walter Scott. From there a most interesting route to take is that which leads to Melrose Abbey, Peebles, Lockerbie, Gretna Green, and Carlisle. This carries the tourist past the Esk River of Lord Lochinvar, the birthplace of Thomas Carlisle, the spot so long celebrated for runaway weddings, and lands him in the lake country of Northern England—the home of Wordsworth,

> "Where Derwent rests and listens to the roar,
> That stuns the tremulous cliffs of high Lodore."

There he can sit and recite Southey's "Why does the water come down at Lodore" as he watches it "eddying and whisking, spouting and frisking, turning and twisting around and around." After taking the

ride from Keswick to Buttermere, that is declared to be the "finest drive in the kingdom," Manchester, Eccles, Sheffield, Castleton, Chatsworth, Derby, Newstead Abbey, and Grantham should next be seen by those seeking interest and instruction. From Manchester to Eccles will be crossed the first piece of railway ever constructed on this earth, and at Eccles station will be seen the first spot on the earth where a human being was mangled by a locomotive —the never to be forgotten "Rocket" of George Stephenson. At Castleton will be seen the abode of "Peveril of the Peak," of Scott. At Chatsworth and Haddon Hall, England's finest home and Dorothy Vernon', interesting romance can be studied together. At Derby, the birth-place of Herbert Spencer and the home of Darwin's grandfathers where he practiced medicine, are but a few doors apart, At Newstead Abbey is the birth-place of the poet Byron, and near by is the Sherwood Forest of Robin Hood. At Grantham will be seen the birth-place and early home of Sir Isaac Newton. Every one of the places named has many interesting sights that cannot be referred to in this brief sketch. From Grantham to Cambridge is but a short ride, and even it is punctuated with romance and pathetic history at several places. On landing at Cambridge we are at once attracted by the beauty of its lawns, gardens, trees, and buildings. It lacks the natural glory of sea and hill possessed by Edinburgh, but man's efforts have done much to overcome this defect. Taken as a whole it is a pretty place and well worth seeing for itself. Taken in connection with its historical associations no educated person can say that he has seen England who has failed to see Cambridge.

Trinity College—but one of its nineteen colleges—has given to the world such scholarly men as Bentley, Whewell, Newton, Bacon, Dryden, Cowley, Herbert, Macauley, Byron, Thackery, and Tennyson. These are men for any nation to be proud of. Cambridge

divides honors with Edinburgh in giving us the Darwins and Dr. Thomas Young. It divides honors with Padua in giving us William Harvey, the discoverer of the circulation of the blood. Harvey was born at Folkstone, near Dover, a place that all should see who travel between France and England by any of the usual routes. He had his early education in Canterbury, another place that none should miss seeing if only because of its magnificent and historic cathedral. But it was in Canterbury that Thomas Linacre, the founder of the College of Physicians of London, was born. He first placed the education of medical men upon a legal basis in English speaking countries. The charter of his college is the model of the charters of all subsequent purely medical and surgical colleges. As physician to Henry VIII, and later to Mary, his influence was great so that he was able to suppress ignorance among medical practitioners, as no one had been able to do before him. He founded a chair of medicine at Cambridge and another at Oxford, thus linking his name with all of the great educational centers of his time. His successor as royal physician to Queen Mary, Dr. John Caius (pronounced Keys), erected a monument in St. Paul's Cathedral to Dr. Linacre and imitated Linacre by chartering and endowing Caius (Keys) College, Cambridge. This is known as "the medical college" of Cambridge. The third of its three famous gates—the Gate of Humility, the Gate of Virtue, and the Gate of Honor—has been praised by the great architect Fergusson as a beautiful example of early renaissance in England. In imitation of Caius and Linacre, John Harvard, another of old Cambridge's great graduates, founded our Harvard University, at Cambridge, Massachusetts. About a century after the time of Caius, Dr. John Ray and Dr. Robert Hooke graduated at the English Cambridge. The first named was the forerunner of Linneus in botany and of Paley in natural theology, thus

starting thought along two of the lines which led to Darwinism. He first defined a species as the word has since been generally understood. Robert Hooke, in his "Micrographia," gave the first picture and description of the cell structure of plants. He was the pioneer student of the cell theory of life. To him we are indebted for the balance springs in watches, and he almost anticipated Newton's theory of gravity. Malthus, "the scientific expounder of the principles of population," graduated at Jesus College, Cambridge. From him, as we have already seen, came the germ idea that led Darwin's mind to the doctrine of Natural Selection. What Malthus was to Darwin Francis M. Balfour, another graduate of Cambridge, and pupil of the well-known physiologist Foster, was to Ernest Haeckel and Fritz Mueller. His "Comparative Embryology" guided Mueller to his recapitulation theory and made possible Haeckel's "Evolution of Man."

As the Darwins linked Edinburgh with Cambridge so Dr. Thomas Sydenham, "the English Hippocrates," linked Cambridge with Oxford. He graduated as Bachelor of Medicine at All Soul's College, Oxford, and as Doctor of Medicine at Pembroke Hall, Cambridge. He saved regular medicine from disgrace by defending the use of cinchona; he started the use of tincture of opium; he was the first to diagnose scarlet fever and the first to identify chorea; he first taught that disease is a conservative effort on the part of nature to overcome some evil cause that he could not fully understand; he fed fevers, and he first advocated the "let alone" doctrine in all cases not properly understood. He was a terror and a crank in the eyes of many of his medical contemporaries, because he in numerous ways anticipated twentieth century medicine, over two hundred years in advance of his age.

The trip from Cambridge to Oxford carries the tourist over a little more than sixty miles of interesting country. Na-

Royal Infirmary, Edinburgh

thaniel Hawthorne wrote that "The world, surely, has not another place like Oxford; it is a despair to see such a place and ever to have to leave it, for it would take a lifetime and more than one, to comprehend and enjoy it satisfactorily." In it there are twenty one colleges, from each of which has graduated many eminent men. Reference has already been made to two of its greatest graduates—Jenner of vaccination fame and Lyell the geologist. The latter led the way to Darwin's Origin of Species by showing the earth's record of progressive development. Darwin's keenest interest centered on this Scotch savan when trying to convince the world of the truth of Natural Selection. Lyell, Huxley, Hooker and the American botanist, Asa Gray, were the four men whom his heart was set upon as the most important converts to make, and he converted them all. Other forerunners of Darwin, on the philosophical side, were Locke and Berkley. They were both Oxford men. Along with Hume, of Edinburgh, they constitute a trinity of reasoners that stirred up human thought to its very depths and paved the way for Herbert Spencer's all-embracing Synthetic Philosophy. Among the medical professors of Oxford, whose studies had much to do with this maelstrom of thought, were Drs. Francis Glisson and Thomas Willis. In Glisson's capsule and in the Circle of Willis we have constant reminders of these two men. Glisson's doctrine of the irritability of protoplasm and Willis's work of cerebral localization constitute large blocks in that temple of truth that has culminated in Darwinism. By going back to the crusades we find that Richard the Lion-Hearted was born at Oxford, and he, next to Barbarossa, was the most important figure of those turbulent times. While theological feuds added little directly to the evolution of medicine as indirect influences they were of some importance. Oxford had a large share of these. The Martyrs' Memorial, to the memory of Cranmer, Latimer

and Ridley who were burned as heretics in front of Baliol College, attests to this. In calmer and saner times the Wesleys and Pusey were products of Oxford. The following are the names of a few important personages of world-wide reputations who have graduated at Oxford: Montgomery the poet, Bishop Heber the author of "From Greenland's Icy Mountains," Blackstone the great lawyer, Johnson the lexicographer Shirley the poet, Hamilton the metaphysician, Froude the historian, Shelley the poet, Charles Reade and Wilkie Collins the authors, Gibbon the historian, Frederic Harrison the positivist, Sir Christopher Wren the architect, Sir Walter Raleigh of tobacco fame, Fox of the "Book of Martyrs," Barham of "Ingoldsby Legends," Arnold of "Tom Brown's School Days," the Duke of Wellington, England's great soldier, Peel and Gladstone England's great statesmen, General Oglesthorpe founder of our State of Georgia, and Oliver Cromwell of the Commonwealth. The Royal Society of Great Britain grew out of scientific meetings started in Oxford in 1648. As I hasten to close the Oxford record the names of Brice and Ruskin come to my recollection as men not to be forgotten among the graduates of that place.

From Oxford to London would be the next logical step in a narrative of this kind. Other interests than medical, however, would attract the tourist to the celebrated and nearby Blenheim Castle that came to the Duke of Marlborough for that "famous victory" that old Caspar told about; to Banbury Cross where legend tells about an old lady on a white horse who had rings on her fingers and bells on her toes; to Stratford on Avon the home of Shakespeare; to Kenilworth Castle with its Walter Scott romance; to Rugby the home of "Tom Brown;" to Coventry of Lady Godiva fame; and to Birmingham that supplies all the world with more kinds of goods than any other half dozen cities on earth. After seeing these one can turn with satisfaction

in the direction of the metropolis of Britain, and, practically, the metropolis of the globe. A sail down the Thames should not be omitted. Windsor Castle, in the grounds of which Harvey made the earliest scientific researches on embryology; Eaton and its colleges; Stoke Pogus cemetery where Gray the poet is buried, and where he is believed to have written his "Elegy;" and Kew Gardens—the most interesting botanic gardens in Europe—can be taken on the way. As the text of this article has already made many references to London, its medical colleges and their graduates, the task has been lightened for the closing of this article. But there are still many important names that have not been mentioned that must not be overlooked. There are Addison and Hodgkin of Guy's Hospital, whose names are household words to every physician, and that cannot be forgotten because of Addison's disease and Hodgkin's disease. To Addison we must trace our first knowledge of the importance of ductless glands. The Royal Society gave us Davy, Farady, and Tyndall, three immortal names of self-made men. Cambridge gave Tyndall the honorary degree of LL.D. Davy and Farady advanced medical science through their chemical discoveries while Tyndall's great service was that of making the work of Lister possible. His evidences of germs in the air and his method of intermittent sterlization by heat were discoveries of incalculable value to life and health. Along with Huxley, who was an M.D. of Charing Cross, the fight for Pasteur and Darwin was conducted. Both were loyal to truth when such loyalty was really needed. Cowardice is a common trait of our race when new doctrines have to be defended against bitter prejudice, but neither Huxley nor Tyndall were cowards. They fought like heroes and they won like giants. Within the walls of Westminster Abbey these and others of the great men here enumerated have been honored by tablets and monuments, which every visitor to London

should see. To the disgrace of that Hall of Fame, Herbert Spencer has been excluded. The false notion that manual dexterity for science is superior to mental prowess in the same noble task is responsible for this. When the method of Zadig is vindicated, as so beautifully portrayed by Huxley, and when the Magi have been conquered by their enemy—common sense—Spencer will have a niche there along with Charles Robert Darwin.

SCANDIA TO GALLIA CISALPINA.

In previous letters concerning "The Lands Where Medical Science Evolved," all descriptions have been of places visited during my peri-terrestral tour. To have closed the series with only what was seen during that journey would have left the story very incomplete. Germany and its neighboring countries were not included in that itinerary, yet they have added enormously to the later phases of medical development. On this account it has been deemed advisable to include them in this separate chapter. A previous tour made by Mrs. Eccles and the author supplied the material with which to complete the record and bring it down to our own day. We had become wearied of spending our holidays seeing American sights and determined upon a change. "The Land of the Midnight Sun" appealed to our curiosity as a proper region to see and securing a state-room on the Steamship Etruria of the Cunard Line, we proceeded to Great Britain. Having spent some days in the British Isles we made our way to Newcastle-on-Tyne where we found the Norwegian cruising ship Vega on which we had 'booked' passage before leaving New York. The accommodations were excellent, and had we not happened to have an exceedingly windy passage across to Bergen everything would have been most agreeable. Byron tells us that,

> "There's not a sea that traveller e'er pukes in.
> Turns up more dangerous breakers than the Euxine."

His experience and ours do not seem to have been alike. During our visit to Turkey we found the Euxine calm and peace-

ful near where it enters the Bosporus. Had he been with us on the German Ocean he might have had a different notion. Its foam-crested, boiling, surging billows beat everything in our experience. We frequently thought of the school-book poem about the Norse sailor to whom such tempests are "only a thing of laughter," and wondered if any of them would love this one "better than sleep." Our seamen certainly did not seem to have any such affection for it, as they, like the passengers, failed to appear at the tables during meal hours. The wind fairly screamed through the rigging. The Vega tossed, tilted, waltzed, and staggered like a toper. Suddenly she would sink away from beneath our feet and then, just as suddenly she would go up with a jerk that reminded us of a catapult. The screw propeller, now in water, then in air, and again divided between the two would shake and jar the timbers of the vessel as if about to tear them asunder. Great waves inundated the decks every few minutes, and as far as the daring eye ventured to look across the deep it had the appearance of a solid mass of soap foam. We had thirty-odd hours of this to endure before reaching the placid waters between the coast islands and the mainland. When the "Oh!—My!" feeling was about at the verge of uncontrolability, despite the prostrate position, a knocking at our state-room door and a cry of, "Come quickly, doctor, a woman passenger is dying!" started me up with a jerk. "How the deuce do they know that I am a doctor?" I asked my wife., "The purser must have seen that you were addressed as doctor, on the letters he had for you when we came on board," she replied. This proved to be the case. The ship had no physician of its own on board, and it became my duty to try the impossible task of curing an ailment in others that baffled my skill to thoroughly subdue in myself. The moral every medical reader, who expects to go a-touring, should take home to himself.

As soon as we passed the island barrier and began skirting the coast the sailing became heavenly. If, instead of trying to save time by taking this short-cut across that tempestuous sea we had gone around, via France and Denmark, to Bergen it would have been impossible to have conceived of a voyage of greater comfort, more bewildering beauty of landscape or more thorough enjoyment than that one proved to be. Many doctor friends have followed us on that route since, and all have declared that it is unsurpassable in everything that an ideal tour should be. Days extend into weeks of calm enjoyment. The sea along the coast is as smooth as a river. The sky, in July that year, was as clear as that of Italy, except at North Cape. There the Arctic Ocean brings very frequent clouds. The fjords are indescribably beautiful. No photograph, or even cinemetograph, can do them justice. In any picture that can be made but one side can be seen at a time. They lose the sense of all-roundness which the real scene produces in us. The frequent rides behind Norwegian ponies, on what the Norwegians call Stolkjars, break any possible monotony that might arise. These are taken overland, from fjord to fjord, the ship, in the meantime going ahead to meet the passengers at the next fjords after leaving them in the deepest recesses of one. In this way alternate fjords are seen upon the ship in opposite directions, by going into one and coming out at another. If readers who have visited the deep and wide canons of the Rocky Mountains will imagine these canons to have, instead of small streams, navigable rivers in which ships can sail, they will get a fair idea of the fjords of Norway. To complete the picture they must add, here and there, innumerable cataracts, make most of the peaks snow clad, and have villages, churches and isolated homes scattered among trees, with here and there an occasional glacier. The water is so deep that the ship can sail near the coast with-

out danger. There is an abrupt descent into an abyss of water at the very edge of the shore. Like our Yosemite Valley, they are all cut out by glaciers. The people met on the short, overland trips between the fjords, are honest, truthful, peaceful, unostentatious, and accommodating. The flower-clad roads constitute a botanist's paradise. Even at the very tip of Europe, where the waters of the Arctic Ocean lave the shore, there is an abundance of beautiful wild-flowers. The globe-flowers and forget-me-nots are particularly beautiful there. The first named are double buttercups with petals folded-in like burnished golden roses. The tourist can gather these at all hours of the night with, in the absence of clouds, the bright sun shining upon him. At midnight, at 2 a.m., at 3 a.m., at any hour he chooses, he is at liberty to look at the sun. If sleep is desired, the state-room windows have to be curtained to keep out the light. Instead of setting, the sun circles round and round the sky, being in the south at midday and in the north at midnight.

The Vega only took us as far as Trondheim, the ancient capital of Norway. There we changed into the Neptun, another Norwegian ship. This carried us to North Cape and back. A very delightful part of this voyage is made among the Lofoden Islands where we were surrounded by numerous fleets of cod-fishing vessels. At the near-by city of Tromso most of the cod liver oil for the world is made. At Hammerfest we visited the most northern city on our globe, and were surprised to find in its streets numerous electric lamps. These are used during the six months of continuous night that they are compelled to endure. They have one day and one night to the year. In summer it is all day. In winter it is all night. Numerous Laplanders can be seen here and on some of the Lofoden Islands. They are short of stature, dirty, and in many ways remind one of the Indians of our western plains.

On return to Trondheim we went by train to Upsala and Stockholm, in Sweden, instead of going back to Bergen. While we thought were in Bergen we learned the fact that it was the birthplace of the great pathologist and expert surgeon, Theodor Billroth. The first resections of larynx and of stomach were done by him. He was professor at Zurich for some time but later removed to

DR. THEODOR BILLROTH.

Vienna where he taught in the university.

On reaching Sweden our first important stop was at Upsala. Here, in the university, the celebrated Linneus taught botany and here he wrote his famous "Systema Naturae" that revolutionized both zoology and botany. Here, too, Scheele resided for a short time hoping for recognition from the university which he never received. Both Scheele and Linneus made their homes at Stockholm before moving to Upsala, and both had to struggle against opposition and poverty. By a lucky accident Linneus won his way to wealth and honor, but Scheele's full worth was not realized until he was dead. While Linneus was striving to build

up a practice as a physician a lady-in-waiting upon the queen had heard of a prescription that had "miraculously" cured a cough and that he had written. She called upon him and got a copy of it. Fortunately it acted "like a charm," and the grateful patient told the queen of how she got cured of just such a cough as was troubling her majesty. The queen had Linnus prescribe for her and after that his fortune was made. Most of the rich people of the city made him their doctor and he soon became wealthy and renowned. His ambition to meet men of science and to have them give him a respectful hearing, that he had so long vainly sought, now were his. Thus it happened that so trivial an event as the writing of a prescription for a cold led to the acknowledgment of worth in an obscure and struggling savant whose ideas were scouted by those whom the world thought were the best of judges. But for that prescription it is pretty certain that our knowledge of living things would have been much less today than it is. Poor Scheele had no such good fortune befall him. His fame began to grow in France and England just before his death, but like most prophets he had little or no honor in his own country. Millions upon millions of dollars have been made from his discoveries but none of it reached his hands. Think of the money that has been made in the manufacture of glycerine, tartaric acid, gallic acid, citric acid, hydrocyanic acid, oxalic acid, benzoic acid, malic acid, and Scheele's green, and then think that he was the first man in the world to produce these and many other commercial substances, for all of which he did not even win the bauble—reputation, until it was too late to benefit him.

But Sweden had another great chemist and he, like Linneus, was more successful than Scheele. This was Berzelius. A park is now named for him and a fine statue that stands in its centre tells of his greatness. It is but a short distance from the Grand Hotel, Stockholm, the hotel patronized by

nearly every tourist and that is one of the finest in Europe, for situation, accommodations and comfort. After practicing medicine for a short time Berzelius turned his attention to chemistry upon which subject he lectured at the Military Academy. A little later and he became professor of medicine and pharmacy, then president of the Academy of Sciences, then chemist to the Swedish iron works, then a senator, and finally he was made a baron. To him we owe many of our chemical elements, many valuable methods of physical and chemical research, and he gave us our present system of chemical symbols. While in Stockholm we took several pleasant walks in Berzleius' Park. We also visited the tomb of Linneus and the statue of Scheele taking more interest in seeing these than in gazing upon the statues of Birger Jarl, Bernadotte, or of Gustavus III, that are deemed worthy of attention by strangers. From our window in the hotel we had a beautiful view of the Royal Palace, just across the Norrstrom. A peculiar public elevator, behind the palace, and known as the "Katarinabisson," was also in sight. The museums were immediately to our left and beyond them the Deer Park and the Tivoli. All of these were visited in turn and a trip taken to Drottingham and its beautiful summer palaces. Admission to all of the palaces was easily obtained.

On our first arrival in Stockholm we observed a number of particulars in which Swedish ways differ from ours, and on stopping, later, at Goteburg and Trolhattan we discovered more of them. In the bedrooms there is generally a huge porcelain affair that reaches from floor to ceiling and decorated as the plates, cups and saucers of our fathers used to be. This we learned is the kind of stove they use in winter. As soon as a traveller arrives he is shown to a room whither he is followed by a clerk with the hotel register. If the room is satisfactory the register is placed open before him, on a table, and

an inked pen handed to him. On looking at where he is expected to place his signature he discovers that a detailed history is wanted. At the top of the page, and across its face are printed in bold type the words: "Dato," "Namn," "Charactaire," "Nation," and "Rum." Getting past the date and name the American guest is puzzled to know what to write under "Charactaire." With Nation there was no trouble, but with "Rum" a guess had to be made as to the meaning. In the hall the observant traveller would note over one of the doors that he passed the startling words: "DAM BAD RUM" and elsewhere "BAD RUM." Such apparent profanity was not mitigated by the remembrance of the fact that a couple or three days before our train had stopped for fifteen minutes at a railway station distinctly and conspicuously labelled, in several places, with the name, "HELL." In demanding to know something about our character the suggestion occurred as to whether they wanted to know if we had been denizens of the last named place. In a few days we discovered that Dam meant lady, that Bad meant bath, and that Rum was the Swedish for room. In hotels and steamboats we discovered that no one is expected to wait at the table, foodless, until the waiter has time to take an order and serve it. As the guest enters the dining-room, or in the hall near the entrance, a table is spread with spiced foods, cheese, bread, crackers, and appetizing liquors. This is their so-called "smorgas," or appetizer. He goes forward, helps himself, carries this beginning of a repast to his table and proceeds to masticate the same while waiting for the waiter. A detailed account of the costumes of Delacarlia, of the canals, lakes and locks, of the habits of the people, and of the many odd things seen during a tour of Sweden would extend this story beyond alloted space, yet all were interesting.

A night's ride in a "Sofvagn," or sleep-

ing car, carried us from Goteburg to Helsingborg. Here we crossed the Sound to Kronberg, the port of Elsinor, in Denmark. At Elsinor the tourist sees Hamlet's grave and the place where he is supposed to have seen his father's ghost. After a brief stay here we proceeded by train to Copenhagen. To the Dane this, his capital, is known as Kjobenhavn. The average Dane knows of no such city as Copenhagen until he comes in contact with foreigners. To the latter this is a delightful city by any name, however unpronounceable, and as a rule the Thorwaldsen Museum is the place first sought out. Whoever has been in Luzerne and seen its famous lion, carved among the cliffs, has ever after wanted to visit Denmark and see Thorwaldsen's masterpieces and his home. Whoever has seen his "Day," and his "Night," wants to see more of such work. While the average tourist is enjoying the original world famed "Tivoil" the dragon tower, the cathedral, Amalienborg, the Stork Fountain, Rosenberg Palace, etc., the medical tourist will desire to see the university where Kasper Bartholin taught medicine and Greek and the place where he wrote his celebrated Anatomie. It was here he discovered the glands of Bartholin and here that his son, at a later date, defended Harvey's circulation of the blood. The up-to-date doctor will also desire to see Finsen's Medical Institute and the State Serum Institute where Finsen and Madson have brought change and progress to the medical practice of our own day. The State Serum Institute is particularly worthy of notice, as the work of Dr. Madson, in conjunction with the work of Svante Arrhenius, of Stockholm, is bringing us to a true realization of the meaning of serum therapy.

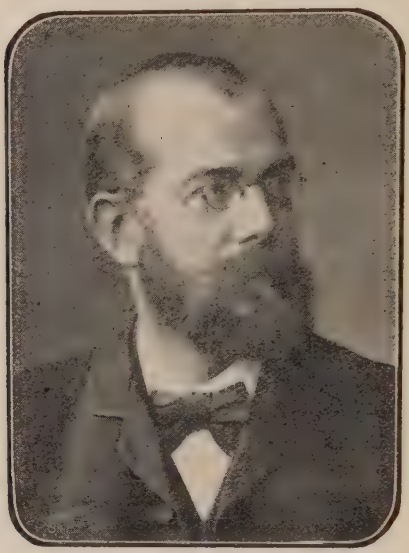
From Denmark we proceeded to Hamburg by way of Zealand, Funen, Jutland, and Schleswig Holstein. In the latter state we passed near Tonning, the birthplace of Esmarch, of bandage and bloodless surgery fame. Our route was a much less comfort-

able one than that generally followed by tourists. We were routed out at 2 a. m. to change trains and have our luggage examined by the custom officers. Schleswig Holstein is German territory, has its own German trains and German officers. Had we gone by ship to Lubeck we would have had an all night sail without being disturbed till morning. Had it been stormy, however, it might have proven even more uncomfortable. Probably the two most interesting sights supplied by Hamburg to tourists is its harbors and park. The former is more fascinating than that of New York because of the complex mazes of canals, rivers and quays. The latter in part was at one time the site of a city wall or fortification. Beyond it, in one direction, lies Altona while in the opposite direction is the main part of Hamburg. The Zoological and Botanic Gardens are connected directly with the park. The anomalous relations of Altona to Hamburg is often a subject of comment. The laws and taxes of the two cities are quite different, and yet it is difficult for any one to know were the one ends and the other begins. Some stores have their entrance in one city and their windows in the other. It was here that medical science gained its first positive proof that water was responsible for the carrying of cholera. The water supplies of the two cities being distinct the infection could be traced to one of them to the exclusion of the other. The sights that principally attract travellers, aside from those already named, are the Elb Bridge, Alster Pavilion, Sandthorqual, Town Hall, Exchange, and St. Nicholas Church. The medical tourist is interested in knowing that this was the home of Fritz Schaudinn, the discoverer of the germ of syphilis, and that he died here a comparatively young man. As a protozoologist he had won a world-wide recognition.

From Hamburg we proceeded to Berlin, the Mecca of modern medical science. Most of the very interesting sights of Berlin,

exclusive of those of its environments, are found on, or near to, Unter den Linden, between the Brandenburg Gate and the statue of Frederick the Great. The Brandenburg Gate is the entrance to the Zoological Gardens. Unter den Linden is an exceedingly handsome street, always crowded in fair weather, and frequently a route for parades. It gets its name from the numerous Tilia, or "Linden" trees, with which it is lined. The American Tilia, or "basswood," is a larger leaved species of the same genus. The Arsenal with its Halls of Fame, the Palace of the Crown Prince, the Royal Library, the Opera House, the Palace of the Emperor, the Academy of Fine Arts, and the university buildings are all on or within easy reach of this thoroughfare. In the last named medical men should be greatly interested. Here the eminent chemist Stahl taught. Here he promulgated a medical doctrine that was almost a counterpart of Christian Science, but freed from the superstitions of the latter. He thought nature was almost all-sufficient as a disease cure if we would but have faith. Here his great rival, Hoffman, the first producer of Hoffman's anodyne, was often seen when serving as the physician of Frederick I. Here Schelling, the idealist, taught, as professor of Philosophy, and stamped the medical science of the succeeding generation with his mark. Here Schonlein, pupil of Schelling, started his "Natural History School of Medicine," the logical outcome of Schelling's teachings as modified by later views of science. Here Schiller, the army surgeon and great poet, likwise absorbed Schelling's views. Here, too, Goethe, the other great German poet and the prophet of Evolution, also took in inspiration from Schelling. Here Johannes Muller taught Physiology as it had never been taught before. Soon after getting his professorship in Berlin he started his "Archiv. fur Anatomie und Physiologie" and continued their publication till he died. Over 260 original contri-

butions to physiology, zoology, and psychology, came from his fecund pen. He sustained the position taken by the Scotch physiologist Bell regarding the functions of the nerve fibres. One has but to hear the names of his many renowned students to appreciate his great influence upon the



PROFESSOR ROBERT KOCH.

development of modern medical science. Is there not magic in the names of Virchow, Helmholtz, Haeckel, DuBois Raymond, Ludwig, Volkman, and Brucke. These all studied under Muller and all drank in the inspiration of his forceful teachings. Schwann, too, the first man in the world to see an animal cell, was trained by him. Virchow took the chair of Pathological Anatomy in this university, in 1856. He first started students in the study of microscopical anatomy. His "Cellular Pathology" was published in 1858. It opened up a new era for medical science. He cleared up our ideas regarding pyemia. Helmholtz began work as an

army surgeon, took the chair of anatomy at the university in 1848, changed to the chair of physics in 1871 and died in 1894. To him we are indebted for the opththalmoscope, for our knowledge of tone sensation, for our knowledge of the sound spectrum, and for multitudes of experimental proofs of the doctrine of the conservation of energy. This doctrine has wrought as great a change in human thought, and in all scientific thought, as has the germ theory of disease, or the theory of natural selection. It would make a long story to tell of all the good things that have come to medical science from Berlin University and from its professors and students who are scattered over the world. We must not, however, pass unnoticed the names of Oskar Liebreich, among the dead, and of Robert Koch and Emil Fischer, among those who are still alive. To Liebriech we are indebted for our knowledge of chloral hydrate and of lanolin. In his theory of "noso-parasitism" he anticipated Wright's doctrine of "Opsonins." In isolating cholin and protagon he made a first step toward a chemistry of brain tissue and of the chemistry of the cell nucleus. Of Robert Koch every medical man in the world has heard. His isolation of the tubercle bacillus and his proof of its being the cause of tuberculosis constituted a brilliant and epoch-making piece of work for medical science. He is now professor in the university and director of the new institute for infectious diseases. His countrymen paid him the honor he was well worthy of and took pains to let all the world know of the great work he had done. They do such things better in Germany than we in America. There is there no "Conspiracy of Silence," as Doctor Salmon once called it. Every American doctor knows of the work of Koch. What relative proportion of them know of the work of Theobald Smith? In my humble opinion, greatly as I appreciate the work of Koch, I cannot help believing that that of Smth is greater still. Each opened up a new epoch

for medical discovery. Koch's task was exceedingly difficult, but Smith's was still more so. What Koch is to medical bacteriology Smith is to medical protozoology. Without Smith's work I am unable to conceive of how Manson and Ross could have given us our present knowledge of trypanosomiasis and of malaria. Unfortunately for Professor Smith the immediate result of his work was related to cattle and not to human beings. Fortunately for Professor Koch his work had a direct bearing upon a human malady. As far more human beings suffer and die from malaria, yellow fever, trypanosomiasis, and kindred protozoon diseases, than from tuberculosis, the American's work is the more beneficial in its far-reaching and important effects. Please let the reader remember that I would not for any consideration try to have him look lightly on Koch's work. On the contrary, the world is never likely to bestow upon him more than a small fraction of the honor which is rightly his. This, however, should not blind us to the merits of a countryman of our own who is at least his peer, but who, through a false and vicious policy of our own educated classes, has failed to receive any reasonable approach to the respect and honor that we all owe him. There are many other Americans who are suffering from this dry-rot-of affectation that maximizes European scientific work while minimizing that done in our own country. I may be mistaken, but it all looks as if short-sighted jealousy was the indirect cause—the fear that some other scientific worker might outclass and overshadow ourselves. We yet have to learn the lesson that is said to have been so pointedly put by one of the signers of the Declaration of Independence, that "We must all hang together, or we will hang separately."

But this is a digression from our story of Berlin. There is now at work there a comparatively young man whose labors are opening up to our understanding what may almost be called the very Holy of Holies of

the Temple of life. This man is Professor Emil Fischer, the great biological chemist. My readers ought to become acquainted with his work if they are not already familiar with it. Here, indeed, "Coming events cast their shadows before." The knowledge he is supplying concerning polypetids carrying us into the heart of true physiology and laying the foundation for a structure that promises to soon give us secrets concerning living things not at present dreamt of in our popular philosophies.

Before leaving Berlin we took a trip to Potsdam to see the birthplace of Helmholtz. Incidentally we "did" the Royal palaces, the Orangery, the Sicilian Gardens, Sanssouci, Babelsberg, Fiedenskirche, Pfingstberg, and the Charlottenhof. After this feast of artificially produced beauty, and after several interesting carriage rides through other suburbs of the city we took a train for Amsterdam. We had intended going to the Hartz Mountains, seeing the wonderland of Hans Christian Andersen, and getting a peep at the Spectre of the Brocken, but when a tourist goes on the Spree he is likely to be so captivated by its environing charms that he dallies too long to leave time for other enjoyments. Had we visited the Hartz country a stop at Gosler would have been made. Being then interested in alkaloids the production, by Dr. Albert Neumann, of cocaine was attracting our attention, and Gosler being his home we wanted to see it. As our train sped toward the west we hoped that it might take us in that direction, but instead it went considerably north of that place after passing Halberstedt.

Concerning the country between Berlin and Amsterdam my diary, for some reason, says but little. It mentions the fact that the women seen from the car windows wore strange looking costumes, and that on our entering Holland we had to turn our watches back an hour. Once in Amsterdam we recalled the fact that it is a city

built upon some ninety islands that, like Stockholm, its houses are supported on stakes driven into the ground, that Erasmus once referred to its people as living like birds on the tops of trees because of their homes resting on the tops of these stakes, that most of the diamond cutting of the world is done here, and that it was the home of Rembrandt. No other city in the world so nearly resembles Venice in having canals for streets, boats for carriages and horses, and doing most of its transportation by water. Its Museum van der Hoop, Museum Fodor, and Rijks Museum constitute the centers for sight seeing tourists. Its zoological and botanic gardens are the attractions for naturalists. The latter is where Prof. Hugo de Vries raised the evening primroses that appeared to spontaneously develop new species per saltum. The solving of the problem as to how and why these flowers changed their specific characters so suddenly is one of the puzzles of the present-day biology and one on which hangs much of practical interest for future medical science. A visit to suburban Zaandam is always in order as every traveller wants to see where Peter the Great donned the attire of a common workman and sought to learn the mysteries of Dutch ship building, in order to strengthen the maritime power of Russia. When in Zaandam tourists can scarcely see anything for the numberless windmills. In journeying from there to Haarlem these dominate everything but the dikes. The wooden shoes, baggy trousers, and strange head-gear of the men and the equally fantastic costumes of the women are every where in evidence. Everybody there seems to work, but the women and dogs are the chief beasts of burden. All the farmers try to own a number of dogs to do their heavy work, but when too poor to buy these they do not hesitate at yolking up their wives and daughters to the carts, and plows, or loading them up with immense baskets filled with produce to carry to mar-

BERLIN HOSPITAL FOR NERVOUS DISEASES.

ket. When not thus employed every woman in that country keeps hard at work, anyway, cleaning and scrubbing themselves and homes. Nowhere else in the world is there so much "elbow-grease" put into the scrubbing of floors, doors, or furniture. This kind of work seems to be a perfect mania among them. The great industry around Haarlem is the raising of lily and other bulbs for foreign gardens. In the season of flowers the country around Haarlem is one vast flower garden. From there to Leyden is a monotonous repetition of dikes, dogs, ditches, and dams, with windmills by the hundred. The great attraction of Leyden is its university. The Leyden jar of the electrician got its name from here, Here Boerhaave first used the thermometer for clinical purposes, and here he established the first successful clinics at a university in order to facilitate the education of medical students. Here he gave the first special lectures on ophthalmology and here, in his clinic, he compelled Peter the Great to await his turn among a lot of charity patients. Here the first famous lithotomist, Rau, taught anatomy and surgery, and for the first time used a cadaver for purposes of demonstration. Here Le Boe, commonly called Sylvius, taught his chemical system of medicine which, though fantastic, led to research and discovery. In the University of Leyden many of the greatest men in various of the sciences were taught. From Leyden we proceeded to the Hague. This is the prettiest city in the Netherlands. Its streets contain fine houses and its canals are not numerous enough to be wearisome. Its private gardens are full of pretty flowers. Its promenades are filled with handsome trees. To us the statue of William the Silent was one of its most interesting sights. This George Washington of Holland dared to defy the brutal and inhuman Philip II of Spain, and fight for political and religious liberty. From the Hague we took trips to Scheveningen, the great watering-place of Northern

Europe, and to Delft, the original home of pottery in Europe. To us the interest of this last named queer Dutch town resided in the fact that it is the birth-place of Anthony van Leeuwenhoek, the man who was the first to microscopically study the brain, the arterioles, bacteria, and protozoa. He first showed how the veins were connected with the arteries and clinched the truth of Harvey's doctrine of the circulation of the blood. In this city, too, De Graaf practiced medicine. He discovered the graafian follicles of the ovaries. After seeing Rotterdam we hastened on to Antwerp. We had often heard of its beautifully finished cathedral and wished to see it, as well as to see the city in which the first bible was translated from the original languages, by Tyndale. He, poor fellow, was burnt as a heretic at the stake because of his devotion to religion. In the south transept of the cathedal is Reuben's famed masterpiece, "The Descent from the Cross." This great painter is buried here, in the Chapel of St. Jaques.

From Antwerp we proceeded to Brussels, the Paris of Belgium. It is in many ways a small replica of Paris. Its Grande Place is declared to be the "finest medieval square in existence." Its Galerie St. Hubert and connecting arcades constitute as pretty and attractive a shopping place as there is in any country. Its Palais de Justice is one of the largest buildings in the world. It occupies more ground space than St. Peter's at Rome and cost ten millions of dollars. On the Rue Royal is the house in which the Duchess of Richmond gave the celebrated ball on the night before the battle of Waterloo, and to which Byron refers in his poem on that battle. In the Place d' Orange there is a statue to Vesalius, the man who redeemed medicine and surgery from ancient ways. He was born here. We have already referred to him as a professor at Padua and elsewhere. This, too, was the birthplace of van Helmont and his statue can be seen in the grain market.

UNIVERSITY BUILDINGS, STRASSBURG, GERMANY.

He modified the system of Paracelsus into a more acceptable type of medical practice.

After visiting the field of Waterloo we proceeded to Cologne, saw its renowned cathedral and the old home of Karl Marx, the great socialist, as well as a number of the interesting things around and in that city, and then proceeded to Bonn. The University of Bonn is its chief sight. Here the present Emperor of Germany was taught, here Johannes Muller, to whom reference has already been made, prosecuted his medical studies. Here Helmholtz taught and here Liebig, the world-famous chemist, graduated. Here, too, Karl von Noorden, now professor of Physiology at Vienna, and great authority on diabetes, was born. From Bonn to Mayence we sailed on the far-famed River Rhine, saw its castles, its vineyards, its romantic and attractive scenery, and its Lorlei. After a short stop at Coblenz we continued our journey to Bingen where we again made a stop and then proceeded to Mayence. Coblenz is the birthplace of Johannes Muller. From Mayence, we went by train to Dramstadt, the birthplace of the great chemist, Liebig, and the site of the chemical works of E. Merck. These works have stood in Darmstadt for over a century, and in them has been manufactured most of the organic, chemical remedies prescribed by medical men throughout the world. Here the first morphine and quinine, made in commercial amounts, was produced. During our stay at Darmstadt we took a trip to Frankfort before going on to Heidelberg. Every visitor to Frankfort is sure to see the birthplace of Goethe; the bridge with the old iron crucfiix and rooster, on the Main; the printer's monument to Guttenberg, Faust, and Schaeffer, the first of the world's printers using movable type, their homes having been here; the statues of Schiller, and Charlemagne; and the grave of Schopenhauer. Medical tourists are sure to go and see Dr. Senkenberg's Citizen's Hospital,

his medical institute, his anatomical theatre, his botanic garden, and his library. The museum of the Senckenbergsche Naturforschende Gessellschaft will likewise be of interest to them. But above all else the new Royal Institute for Experimental Therapy, under the care of Dr. Paul Ehrlich and his collaborators, will attract the attention of the up-to-date medical man. Here the wonderful research work of Ehrlich, Morgenroth, Neisser, Lipston, Rehns, Sachs, von Dungern, Proscher, Shiga Marx, and Keyes has been carried out. The foundation for such work was first made in this country by Salmon and Theobald Smith and then carried on by Roux, Behring, and Kitasato. Through such work we are solving the secrets of immunity.

At Heidelberg we were greatly interested in the beauty of its surroundings and in its old university—the oldest in Germany. Its famous castle, high above the city and above the Neckar River, adds materially to the beauty as well as to the historical interests of the place. Large numbers of American students come here to finish their education so that it is a place that is well known to many Americans. The great Helmholtz, to whom we have already referred, taught physiology here and away back in 1653 Brunner, for whom Brunner's glands are named, was likewise a professor in the university. Brunner studied medicine at Strassburg and to this city we made our way after leaving Heidelberg. In Strassburg Kobert, the great toxicologist and pharmacologist, of Rostock, was born and Professor Paul Ehrlich studied medicine here. Every school boy has heard of the great astronomical clock in the cathedral of this city and longed to hear it strike and see its procession of strange figures at the striking hour. Almost every person must have seen pictures of Strassburg storks standing upon one leg on the quaint old-fashioned chimneys of this curious looking place. A view of the city from the cathedral tower is worth a long journey to see.

From Strassburg we went by rail though the corner of the Black Forest to Schaffhausen, the birth-place of Johann Konrad Peyer, the discoverer of Peyer's glands. Most typhoid patients who are seriously attacked with this disease learn sooner or later, something about "Peyer's patches."

A short journey from here brought us to the celebrated Falls of the Rhine. After drinking in their beauty for a while we took the train for Zurich, Switzerland. Here Oken taught, and near here Paracelsus was born. Haeckel tells us that Oken's ideas came nearer to those of Darwin than did any other predecessor. Paracelsus taught medicine in Basil until wine upset his equilibrium and caused him to accuse all doctors and pharmacists of ignorance and dishonesty. They then turned around and pronounced him the worst of quacks. We owe the use of mercury in syphilis to him, and he first rescued the use of cinchona from the Jesuit priests. The great embryologist and anatomist Wm. His was born at Basil.

Our next stopping place was Berne, the home of the great physiologist, Haller, who first taught us the doctrine of muscle irritability, and who as a botanist was surpassed only by Linneus. Berne was likewise the home of Dr. Kocher who first showed us the way to the discovering of the functions of the thyroids. The beauty of Swiss scenery it is unnecessary here to describe, nor need I tell of our interesting tours through Swiss mountains and Swiss valleys. It would only be the repeating of an oft told tale. With Switzerland ended our tour of the "Lands Where Medical Science Evolved." To have completed the picture Austria-Hungary and Russia should have been included, but these countries we have not yet visited, though we hope to be able to do so before long, and thus be able to tell the readers of the "Medical Fortnightly" something about a number of medical worthies who have not been mentioned in our narrative, but who have done much to help medical science to its present exalted position.

THE BIRTHPLACE OF BILLROTH.

191 Dean Street, Brooklyn, N. Y.,
March 29, 1910.

Editor Medical Fortnightly:

All well-informed students know that history is slippery ground, and that censorious critics have said many hard things about its inaccuracy. A slip of mine, which Dr. H. Stern kindly points out, is a forcible reminder of how easy it is to err in such matters. In my letter on "Scandia to Gallia Cisalpina," Bergen in Norway has been credited with being the birthplace of Billroth. The impression received from my readings, prior to visiting that place, are responsible for the statement which now seems to be an error, Billroth was born in Bergen, on the Island of Rugen, in the Baltic, not far from Stralsund, the birthplace of the Swedish chemist Scheele. In my letter reference should have been made to Billroth and to his accomplished teacher, Langenbeck, as part of the description of Berlin. The great prominence of Norway's Bergen and the relative obscurity of other Bergens appears to have puzzled a number of authors. In two histories, just consulted, the birthplace is given as "Bergen" without regard to which of many Bergens is meant. Naturally readers fail to think of the Bergens of Belgium, The Netherlands, New York, New Jersey, or the three Bergens in Germany, and do think of the one best known. The correction is timely and may save future writers from the same mistake.

Very sincerely,

R. G. ECCLES.

ACROSS NORTH AMERICA—WESTWARD.

Every reader of the Medical Fortnightly must be familiar with the parable in which the kingdom of heaven was likened to a man who hired laborers for his vineyard, paying to each the same daily compensation whether they began work at 5 a.m. or at noon. The objectors to this seeming unfairness were peremptorily told that a master had a right to do as he saw fit with his own property, and that they ought to learn that in the kingdom of heaven destiny had so arranged things that "the last shall be first and the first last." In these travel tales such a reversal has actually occurred, bringing our country in at the close, and, if our attempts at prevision are not seriously faulty, the United States though the last to begin work in the vineyard of biology, is destined to become first in the amount and quality of the work it is going to accomplish. For the very brief period of its efforts the returns are, relatively, greater than those of many older nations.

Thanks to the generous liberality of our Rockefeller, Carnegie, Elizabeth Thompson, the McCormicks, Johns Hopkins, Phipps, and others, funds and laboratories have been supplied and an example set for still other conservors of public wealth to go and do likewise, when the stream of gold they have had the skill to direct begins to transcend their power of utilizing it in new productive channels. We are already rapidly hurrying into the forefront of science, but our great danger—the incessant danger of every democracy—menaces us with defeat.

This danger is due to speed madness on one side and sentimental hysteria on the other. Impatience and pity the two best yet two worst traits of human nature—make excellent servants but woefully brutal masters. Like a holocaust of consuming flame they can be fanned into horrible uncontrollability by trivial causes. They are the agents that direct would be reformers and the latter are the anarchists of science. In the name of reform they invoke the fetish of legislation, hoping to accomplish in an hour what would require a century. They fail utterly to appreciate the fact that evolution is and must be slow. Compulsory progress always means weakness in progress where it does not mean positive reversion. This is why he who announces himself as a reformer is usually at heart a rampant anarchist, defying nature as the political anarchist defies government. Utterly oblivious of the established harmonious adjustments of beneficent forces, that lie too deep for his superficial methods of mental analysis, he seeks compulsory adjustments that disrupt, tear, and rend society to its core and along lines that he never dreamed he was going to affect. Blind and oblivious to everything except the relatively trivial evils, that nature was at work curing before he was born, he exaggerates these evils from molehills into mountains and the bewildered masses, taking his madness to mean earnestness in their behalf, help him into power. Usually he is right regarding the existence of the evils he points out, and he would be an excellent educator if he could be put into a straight jacket as soon as his symptoms are so severe that he asks for legislative aid to do that which in the nature of things, neither he nor the legislators can appreciate the seriousness of meddling with in that manner. In biological work the danger from impatience and short sighted pity are intense. They work together in a vicious circle. A demand for quick results, in order to have weapons with

which to pacify, confound, or defeat hysterical objectors to such work leads to the intensification of the very conditions against which the sympathetic protest.

Proper experiments—those that are really scientific—are intelligent questions put to nature in order to get its "Yes" or "No." The reply, usually anticipated, confirms or corrects the ideas of the experimentor. Haphazard experimenting, with the vague hope of a chance discovery, Tyndall has said, is jargon addressed to nature, and the reply is usually likewise jargon. The torture of animals with jargon experiments is atrocious. Ignorant sentimentality intensifies public impatience and the attempt, on the part of experimentors, to hurry up results brings unnecessary cruelty. If we, as physicians, wish to stop physiological cruelty we must turn deaf ears to those who would place unsympathetic overseers over our experimentors. The way to make jargon experiments abhorrent is to pillary with contempt all who resort to them, and use existing laws to punish them. Paid inspectors can never understand or sympathize with science. America should, and can, take the lead in the important task of advancing medical science. Let us help it by understanding its needs and directing public sentiment away from the support of its enemies. Already the good work is progressing and this travel tale aims to show its promising character. In presenting the facts in the way here used I desire in this, as in prior communications, to imitate the Bishop of Bedford in that,

> "The care-worn traveller in dusty ways,
> The things that I see shall see,
> And give to the Giver his song of praise,
> As he shares my joy with me."

In seeing North America the writer has, when taking his summer holidays, adopted the plan of visiting, in successive years, places of historic interest, scenic interest, botanic interest, geologic interest, etc. Our country has thus been seen, piecemeal.

BROOKLYN.

Brooklyn, where my transcontinental tour began, is known as the "City of Churchs," but, besides a long list of these it contains a dozen hospitals, eight or ten dispensaries, the world famous Greenwood Cemetery, the incomparable Coney Island, the world's finest suspension bridges, two parks of intense historic interest, fine public buildings, a subway in which travellers pass beneath an arm of the sea and have immense ocean steamships sail over them, a Long Island College Hospital where the first American experiment of bringing medical teaching and medical training together was begun in 1857, a pathological laboratory, etc. A few minutes walk from where these words are being written the fate of the United States, as a nation, hung in the balance as never before nor since. In Prospect Park the British and American troups had one of their most fierce battles. By a mistake of General Putnam, the American troops were caught in a trap where absolute annihilation threatened them. At Gowanus bridge the soldiers of Cornwallis were held at bay for ten minutes—the most precious ten minutes in American history. It enabled our army to escape destruction. The Brooklyn Institute of Arts and Sciences has been doing much for biology, and thereby for medicine, through its Cold Spring Harbor marine laboratories. Every summer this is a Mecca for many biologists who there have made discoveries in heredity, tissue regeneration, organ transplantation, embryology, and prenatal malformations. The Carnegie Institute station for Experimental Evolution is likewise there and, practically new creations in animal life have been produced therein, by Professors Charles B. Davenport, W. L. Tower and others. The new botanic garden of the Brooklyn Institute is under the care of C. S. Gager who has, experimenally, created some new plants. It was George R. Fowler, of Brooklyn, who first

SENEY HOSPITAL, BROOKLYN

started the first aid to the injured classes, and to him the world is indebted for a method of gastro-enterostomy, of total pleurectomy, and of inguinal hernia. He also worked out a valuable method of preparing catgut and "Fowler's position," after operating in peritonitis, is known to all surgeons. L. S. Pilcher, another Brooklyn surgeon, introduced a new method of reducing Colles' fracture, and a new method of treating hemorrhoids. A. J. C. Skene produced what is, probably, the best work on gynecology in our country. Charles Jewett was the first in America to perform symphyseotomy. The writer experimentally established the United States Pharmacopeial test for pepsin, that afterwards became, with slight modifications, the test for the world; performed the first experiments upon the effects of acids, antiseptics, and drugs generally, on pepsin, and first showed the value of benzoic acid as a preservative.

NEW YORK CITY.

Across "East River," from Brooklyn, is the borough of Manhattan. Its "sky-scraper buildings," Wall Street, Broadway, Bowery, Fifth Avenue, Riverside Drive, Central Park, Bronx Park, botanic garden, zoological garden, aquarium, public museums, public buildings and monuments, command the enthusiastic attention of most visitors. Patriotic Americans are interested in visiting Washington's statue, that stands on the spot where he became the first president of the United States, and learning that when there they are surrounded with more than the wealth of Croesus. The mint faces them, J. P. Morgan's offices are behind them, while banks and safe deposit vaults surround them. So numerous are the hospitals and dispensaries of Manhattan that medical visitors would be wearied inspecting them all. Here they could spend weeks seeing all sorts of new operations and learning of many methods of treatment. With such advantages it is surprising that it remained for John A. Wyeth, of our own

generation, to think of utilizing them by starting his Polyclinic—the first American post-graduate college, and, today, the most successful. Medical men from all parts of the United States come here to round out their education under his special care. It was in the same borough that the first American medical journal, the New York Medical Repository, saw daylight, under

DR. JOHN A. WYETH.

the editorial care of Elihu H. Smith. Here Samuel Bard helped found King's College and, in 1807, became dean of the College of Physicians and Surgeons—the first American medical college to demand a high standard of education. Here James Macneven started the first American Medical Chemical Laboratory. Here David Hosack introduced to our country vaccination, the stethoscope, quarantine, ligation of the femoral artery in the upper third of the thigh in imitation of Scarpa, and advocated the establishment of municipal hospitals for contagious diseases. Here Wil-

lard Parker performed cystotomy for the first time in America and also operated for appendicitis. He was one of the organizers of the New York Pathological Society. Here John Torrey turned his attention to American botany and helped lay the foundation for our knowledge of evolution. Here Valentine Mott won his reputation in surgery by becoming the American pioneer of many difficult operations. Among these was excision of the collar bone for osteo-myelitis and the ligating of the innominate artery for aneurism. Here John C. Dalton introduced class experiments in physiology, did his work on the Corpus Luteum that won for him the A. M. A. prize, and gained the reputation of being the first American professional physiologist. Here Alonzo Clark introduced into American practice the use of sodium salicylate in rheumatism. Here Austin Flint popularized physical diagnosis and by aid of his facile pen kept medical men interested in the progress of medicine. Here J. Marion Sims revolutionized the practice of gynecology for the whole world, invented the duck-bill speculum that bears his name, introduced the use of silver sutures, and treated vesico-vaginal fistula with a success never before approached. Here Henry Draper taught us how to use photography in medicine, determined the function of the spleen, and very materially advanced 19th century astronomy and physics, particularly in the direction of stellar spectra. Here J. A. Wyeth, besides founding our first post-graduate college, as already mentioned, lessened the death rate by substituting ligation of the external carotid for ligation of the common carotid, introduced his bloodless method of amputating at the hip joint, and greatly improved the treatment of vascular tumors by cooking them with water injected into their substance. His essays on the Carotid Artery, and on the Innominate and Subclavian Arteries and his most excellent volume on Surgery have added materially to our knowledge of anatomy and surgery. The

essays won for him two prizes from the American Medical Association. Here Simon Flexner enriched our knowledge of cerebrospinal meninigtis, of its treatment, of plague, of bacillary dysentery, of toxins and antitoxins, and of snake venom. Here Eugene L. Opie discovered a multitude of before unknown facts concerning the anatomy and pathology of the pancreas, of its relationship to diabetes, of the nature of inflammation, of protozoon infections, of enzymes in inflammatory exudates, and of enzymes in the bone marrow. Here Christian A. Herter has discovered a world of facts regarding the flora of the intestines and has very materially added to our knowledge of chemical pathology. To him is also due the credit of giving to America its first Journal of Biological Chemistry. Here S. J. Meltzer, through the munificence of John D. Rockefeller, has established the world's research laboratory, given us new information on the mechanism of deglutition, on the bactericidal action of the blood, on how fluids are carried from the peritoneal cavity into the circulation, on the absorption of strychnine and hydrocyanic acid by the mucous membrane of the stomach, on respiration without respiratory movement, on toxicity of the bile, on the physiology and pharmacology of magnesium salts, on pseudo-tuberculosis, and on the relation of lesions to the multiplication of and infection by bacteria. Here Gary N. Calkins, although not a physician has advanced our knowledge of cancer, smallpox, and pathogenic protozoa. Here H. H. Rusby advanced our knowledge of medicinal plants. Here P. A. Levene discovered new facts about nucleo-proteids of the spleen, leucin in animal proteins, phloridzin effects on the bile, and gelatin. Here H. Noguchi simplified the Wasserman test, and enriched our knowledge of lecithids, snake venoms, toxins, hemolysins and eosin. Here C. McBurney evolved new methods for gallstone operation, abdominal aorta compression, and in-

cision in appendicitis as well as making us familiar with McBurney's point. Here A. Jacobi advanced our knowledge of diphtheria, intestinal diseases, the origin of calculi, the thymus gland, and of heredity in syphilis. Here E. L. Keyes produced his evacuator and prostatectomy pad, and developed his operation for varicocle as well as gave new facts on venereal diseases. Here Christian Fenger evolved his operations for ureteral stricture, and valve-formation of ureter. Here E. B. Wilson advanced our knowledge of the cell, and T. H. Morgan supplied new facts in embryology, regeneration and comparative anatomy. Here H. F. Osborn has increased our knowledge in the causes of evolution and pointed out the fact that disease is a factor in natural selection. None of the last three are physicians. The present writer deems this association of disease with natural selection exceedingly important for the future of medical science. To me it seems almost a certainty that our entire interior structure is an accumulation of myriads of selected defences against disease.

ALBANY.

After seeing New York, a trip up the Hudson River, by the day boat, to Albany, is one of the things no visitor should miss. It is the nearest approach to a sail through the fjords of Norway that our Atlantic coast can supply. The scenery is enchanting and, in its primitive wildness, must have been very alluring to Henry Hudson and his Dutch crew when they sailed up it with the hope that it would lead them to the Pacific Ocean and to Asia. The basaltic cliffs, known as the Palisades, tell us of some ancient volcanic eruption that covered the region with lava, and the deep-cut channel of the river attests how the ice of the glacial age cut its way through the same on its passage toward the sea. Sleepy Hollow, and the Catskill Mountains, are reminders of Rip Van Winkle and his long sleep. West Point is a beauty spot

where young Americans are trained in the art of war. Many handsome country homes, of rich New Yorkers, and many pretty towns, nestle along the green slopes of the river's bank. The West Shore and the Hudson River Railways skirt the respective banks most of the way to Albany, so that the passage of passenger and freight trains on both sides of the river, and going in both directions, are continuous additions to the interest of the trip. To the historian Albany will always be of interest as the first Dutch settlement in America, as the second oldest settlement of white men on the Atlantic coast, and as the capital of the richest State in America. To the Dutch it was known as Beverwick, and as Willemstadt, but when captured by the English in 1664 the name was changed to Albany in honor of the Duke of York and Albany. New York got its name from his first title and Albany his second. As lord of the Highlands of Scotland, then known as Albany, he thus conferred a Scotch name on the city but, singularly enough this same name was the one by which all of Britain was known to the Romans when Aristotle wrote his "Treatise of the World." The capital is Albany's finest building and cost the State nearly twenty-two millions of dollars. The building, however, that is likely to be of greatest interest to medical men will be its medical college. There the man received his medical degree whose research work has counted for more than that of any other American, so far as the future of our knowledge of disease is concerned, and in that city he was born. He and Salmon were the first in this world to produce artificial immunity toward disease by inocula tions of toxins formed during bacterial multiplication. Roux and Chamberland, of the Pasteur Institute, have been given the credit for this when in fact it was first discovered by Americans, in America. Until this discovery had been made we could have known nothing about antitoxins or of immune sera. Our whole modern knowl-

edge of immunity against disease had its birth in these experiments. To this same gentleman we are indebted for our first step in our knowledge of the self-digesting power of tissues, removed from the body under strict antiseptic care. The far-reaching consequences of this discovery of his are only beginning to be appreciated by students of Mendel's law who are familiar with pathology. During Ehrlich's visit to America this same gentleman called the German pathologist's attention to the strange fact that when animals are injected with a foreign serum repetition of the dose, a week or two later, leads to serious or fatal results. From this beginning we got our modern knowledge of anaphylaxis, that is likely to play havoc with a lot of the old notions we had concerning the physiology of digestion, and that is pretty certain to enlighten us on idiosyncrasies toward foods and medicines. When it comes to be applied to embryology we may see a revolution in our ideas. Our most serious cases of asthma are also likely to have light thrown upon them from this quarter. The same gentleman, assisted by Dr. Kilborne, worked out the life history of the protozoon of Texas fever. This work was epoch-making for protozoology inasmuch as it gave the clew to the life histories of the malarial and other such parasites. The task was then, probably, the most difficult one of the kind ever undertaken, because of its great complexity and its covering two generations of the infected animals, besides the infected ticks. Koch's work with the tubercle bacilli was much simpler. Among many other exceedingly important contributions to medical science that have come from him are his discovery of where discontinuous sterilization may be ineffective, his researches on bovine and human tuberculosis, on the production of indol by bacteria, on the differentiation of related bacteria by their pabulum, and on the production of immunity with balanced or neutral mixtures of toxin and antitoxin. Four of his

discoveries appear to be epoch-making, and any one of these four would have immortalized the discoverer in Germany, France, or England had he resided in one or other of these countries. If ever scientific man deserved to be honored with Nobel prize, or peerage, it is this author's honest conviction that that man is Professor Theobald Smith, of Harvard University. He is a stranger to me, personally, but as a student of science

THEOBALD SMITH, M. D.

I know of no other man of our day who has opened up so many new and important regions by research. American silence is construed in Europe to mean American indifference and where such indifference exists prizes are not going to be bestowed. Our statesmen and politicians show no such indifference and our country has been glorified accordingly—in politics.

SARATOGA SPRINGS.

From Albany we proceeded by rail to Saratoga Springs, drank of its effervescent

waters, that nature has there so bountifully supplied, visited Mount McGregor and the cottage in which General U. S. Grant died, and after taking in the beauties of the great summer resort proceeded to Caldwell. Here a trip up Prospect Mountain gives the visitor a magnificent view of Lake George and a sail on the lake steamboat to Baldwin proves to be a continuous panorama of ever changing beauties. A four miles trip on the train to Fort Ticonderoga, takes the tourist to the Lake Champlain steamboat which carries him through another ever changing maze of mountain beauty. Landing at Plattsburg he is ready for carriage rides to Bluff Point, Ausable Chasm, and a short distance into the Adirondack Mountains where he can see the last resting place of poor John Brown whose body has so often been sung about, as mouldering in that grave. While Brown will recall to the mind of the visitor our Civil War the numerous stopping places bearing the pre-name "Fort," that cover the country from Saratoga to Canada, will recall the French and English wars and our war of the Revolution.

MONTREAL.

The trip from Plattsburg to Montreal is a short but, historically, very interesting one. The points of chief interest to medical tourists, in Montreal, are McGill College, Mount Royal Park, the General Hospital, Royal Victoria Hospital, Hotel Dieu, St Helen's Isle, the great Victoria Bridge and Lachine Rapids. McGill College will, of course, be associated in their minds with William Osler and John G. Adami. The former won fame through his brilliant ability as a teacher, his classical studies in cerebral palsies of children, his investigations of chorea and choreiform affections, and his studies of gastric cancer, abdominal tumors and angina pectoris. His System of Medicine is the most complete work of its kind ever produced by an American. Dr. Adami has given to the profession what

is probably the most thorough and up-to-date text-book on Pathology that has ever been published. His researchs on the mammalian heart, inflammation, heredity, cirrhosis, cancer, and tuberculosis have won for him world wide recognition as an

J. GEORGE ADAMI, M. D., F. R. S.

able investigator. Osler graduated and taught at McGill and Adami is Professor of Pathology there. Mount Royal Park lies immediately behind the University and from the summit the visitor can have a most fascinating view that extends to the Laurentian Hills, the Adriondacks, up and down the St. Larence River, and off into the Green Mountains of Vermont, while immediately below lies the city of Montreal. The public park on St. Helen's Isle is beautifully laid out. The "shooting," in a steamboat, of Lachine rapids is one of the thrilling experiences of a visit to this region.

QUEBEC.

Side trips to Quebec and to Ottawa added to the interest of our visit, the former by boat and the latter by train. Quebec is very much like many of the old European cities in its narrow, steep streets, its fortifications crowning the hill, and its numerous French-speaking inhabitants. The view from the Chateau Frontenac is very fine, and the trip to Montmorency Falls exceedingly interesting. Ottawa is much more modern than Quebec and its Houses of Parliament, occupying the highest point in the city give it a stately and artistic look. Ottawa river recalled to my memory Moore's Canadian Boat Song that, as a boy, I had often sung. In the evening the moon shone brilliantly overhead and on repeating the words,

> "Ottawa tide yon trembling moon,
> Shall see us float over thy surges soon,"

I became for a moment a child again and felt the old longing that the song formerly produced of, "How I would like to see that place and row a boat on that lovely river."

TORONTO.

On our return from Ottawa to Montreal we took the Steamboat Spartan for a long, two days sail up the St. Lawrence River to Toronto. The successive rapids were passed by taking canals that skirted the edge of the river. The sail through the Thousand Islands was charming, although we had been there before and spent a couple of weeks at Thousand Island Park Hotel. The beautiful cottages on many of the islands give them a most attractive and poetic appearance. The entire St. Lawrence trip is interesting, but in places it has a wild beauty that is captivating. After reaching Toronto we spent a few hours seeing its handsome university, its Toronto and Trinity medical schools, hospitals, parliament buildings and its parks. There are two professors who while connected with the University of Toronto have

added to the medical knowledge of our age and are well known by their reputations to many medical men in the United States. These are James P. McMurrich, the anatomist, and Archibald B. Macallum, the physiologist. McMurrich now holds the chair of Anatomy in Michigan University. Macallum's research work has been quite extensive in the various departments of physiology. Among other discoveries he has made are those relating to the micro-chemistry of cells and the peculiar habits of phagocytic leucocytes of leaving the blood stream, entering the intestines, engulfing foreign substances and carrying these back into the blood with them. The important bearing that this must have on our conceptions of how diseases are caught is obvious. Had this work been done at the time we were in Toronto there would have been great temptation to have hunted him up and learned more about the matter. As it was we hurried away and took a boat for Lewiston from which point we inspected the gorge of Niagara River up to the falls. Here, of course, we went the usual rounds of seeing the suspension bridges, the Whirlpool, the interior of the Cave of the Winds, Goat Island, and taking the usual sail, immediately below the Falls, in the "Maid of the Mist." Having seen these sights a number of times before, and having looked upon them when enshrouded in ice and snow, the novelty was worn off, but no one can cease enjoying Niagara. When seen for the first time, many years ago, there were no electric plants nor other manufacturies drawing from its water as now. These take much of the charm away and as they increase in numbers the glory of Niagara will wane, if it does not finally disappear. It is but a few miles to Buffalo and that growing city is likely to draw increasingly on the power of the falls to run its machinery, light its homes, and propel its trolley cars. During the Buffalo Exposition all of the buildings on the exposition grounds were brilliantly

illuminated by electric power from Niagara. They looked like a bit of fairy land but while enjoying such splendor it was difficult to refrain from heaving a sigh at the lessened grandeur that this meant for the falls.

BUFFALO.

Every visitor to Buffalo is sure to be greatly impressed with its beautiful parks, its fine, broad boulevards, its "Front," its artificial lake with nearly four miles of path around it, its State Insane Asylum, and its city hall. Austin Flint was one of the founders of the medical college and John Dalton, "America's first professional physiologist," taught here.

UP THE GREAT LAKES.

From Buffalo we proceeded on the steamship "Northwest" for Duluth, Minnesota. Being July this lake route was deemed cooler than by rail. During much of the voyage overcoats were required. The Cleveland stop recalled a prior visit and an excursion to Put-in-Bay, where Perry won a victory over Britain. Did fate, accident, or miracle place there mines of strontium ore from which to procure fireworks of a lurid red with which to celebrate that and other victories, on July 4th? The beautiful, but small, crystal cave that is there is in the strontianite. It excels all other caves in this country for corruscating brilliance. On one of the islands is a mass of prehistoric Indian sculptures and, what is still more interesting, one of the most remarkable carvings of the ice during the glacial period, that exists in this or any other country. The rocks are fluted and polished as if designed for a cornice. Our next stop was at

DETROIT, MICHIGAN,

a handsomely laid out city on the Detroit River. Its streets radiate from two centers, intersected by others that form concentric circles to the centers. It contains four large

hospitals, as many dispensaries, one regular medical college, and its Belle Isle Park is very beautiful. In this city Dr. T. C. McClintock has recently worked out a method of producing autolysis among infecting gonococci. The State of Michigan has its medical school, connected with the university, at Ann Arbor, inland from Detroit. At this school a large amount of research work is being done in pathology, physiology, and anatomy. It was organized in 1850 and has students from many states in its classes. Citizens of the State have only a small matriculation fee to pay and a small annual fee of merely nominal amount. Those from other states have much larger fees to pay. F. G. Novy, associated with W. J. McNeal, lately accomplished an exceedingly important piece of work in discovering a method of artificially cultivating some kinds of pathogenic protozoa. In conjunction with Victor C. Vaughan he increased our knowledge of the ptomaines and quite recently these two have taught us much about cell toxins. J. P. McMurrich has added to our knowledge of invertebrate morphology and of anatomy. G. C. Huber has given us a lot of new information in histology, anatomy, physiology and embryology.

Leaving Detroit we sailed through lakes St. Clair and Huron to the straits of Mackinac, making a stop at Mackinac Island. Old Fort Mackinaw, near here, has been frequently batted about by the exigencies of war. At one time French, then English, then French again, then once more English, then American, then English again and finally American. Returning to the St. Mary's River our ship next proceeded to Sault Saint Maria where we had the pleasure of passing through what is claimed to be the largest canal lock in the world.

CHICAGO.

Had our ship not turned about at Mackinac we could have gone on down Lake Michigan to Chicago, a route previously

taken. This city is on so many railway lines from New York to the West that the writer is almost as familar with it, by his frequent visits, as he is with New York. Its Jackson, Washington, Douglas, Garfield, Lincoln and Humboldt Parks, its Graceland, Rose and Calvary cemeteries, its numerous monuments, fine buildings, hospitals, dispensaries, and medical schools and its universities are all of interest to visitors

NICHOLAS SENN, M D.

and nearly all very beautiful. So many visited it during the World's Columbian Exposition that it is quite likely that most readers of this communication have been there and that descriptions are almost superfluous. To know something about the Chicago physicians who have stamped the world with their seal of scientific research work is of far greater importance. The two best known among these are, probably, Nicholas Senn and John B. Murphy. As surgeons both have won wide recognition. Senn's bone ferrules, bone chips, and bullet probe, his method of treating intracapsular

fractures of the femur, fecal fistula, and cancer, of excising the shoulder joint, of fixing the kidney and of gastrotomy are well known. Murphy's "button" is quite familiar and he has added to our knowledge of the surgery of the gall-bladder, appendix, liver and of gun-shot wounds of the abdomen. L. Hektoen has supplied new facts concerning opsonins, lysins, isoagglutinins and of the relations of streptococci to scarlet fever as well as showing some important bearings of pathology to evolution. H. Gideon Wells has given us new information on chloroform necrosis of the liver, pathological anatomy of hydrozin poisoning, purin metabolism in fetus and placenta, chemistry of the liver in acute yellow atrophy, uric acid infarcts in kidneys of new born, the bearings of enzyme reversibility to pathology, the changes due to delayed chloroform poisoning, and anaphylaxis. G. Frank Lydston has improved the treatment of urethritis and of virulent conjunctivitis and has pointed out the evolution of local venereal diseases as well as the fact that disease is a part of natural selection. Byron Robinson, through writing and research, has greatly advanced our knowledge in anatomy, surgery and gynecology. A. P. Matthews has increased our knowledge of nerve irritability of the relation between solution tension, atomic volume, and the physiological action of the elements as well as supplying a suggestive working hypothesis for the study of cell mitosis. S. A. Matthews has shown us the effect upon the heart of experimental obstruction of the left coronary artery, and shown us the action of aconitia. W. L. Towers has given important experimental evidence of evolution, and Ralph S. Lillie has helped us along similar lines and toward a knowledge of the nature of parthenogenesis. These last two are not physicians.

MADISON, WIS.

Our return from Chicago to renew our trip at Soo St. Marie is a reminder of another medical man who has added to the sum total of medical progress, and whose home is off our route. This is Charles R. Bardeen, of Madison, Wisconsin, who has increased human knowledge in comparative anatomy, experimental morphology, and human and comparative embryology.

ST. PAUL AND MINNEAPOLIS

On reaching Duluth we journeyed to St. Paul by train, passing over regions that, in a visit of former years, was covered with dense forest, but is now under cultivation. At our first visit St. Paul and Minneapolis were looked upon as far apart but now they are almost converted into a single, picturesque city. Here is one of the prettiest spots on the Mississippi. A sail from here to St. Louis, such as the writer took many years ago, must be now much more charming than it then was but the boat accommodations are probably not as good as at that time. Minnehaha was less of a "laughing water" than in the olden days and Fort Snelling seemed to have aged. Minnetonka Lake still bore much of its old beauty. Mills of various kinds had spoiled St. Anthony Falls and the village of St. Anthony was little more than a memory. We hastened away, after looking over the old sights, feeling that the destruction of natural scenery by growing civilization was, probably, on the whole for the best.

YELLOWSTONE PARK.

An uninterrupted trip to Bismark brought us into North Dakota, the State in which Prof. H. L. Bolley is proving, experimentally, that disease is an exceedingly important force in plant creation. As our train sped through the "Bad Lands," and we saw the curious forms, like ruined castles, wrecked cities, unfinished monuments, and pictures of utter chaos and des-

olation, that the rocks had assumed, we tried to imagine how tempest and flood, followed by the spontaneous firing of exposed beds of coal, had wrought such havoc in the stratifications of ages. On reaching Livingston we changed cars for Cinnabar and at the latter station found the stage coach ready to carry us to Mammoth Hot Springs, in the Yellowstone National Park. This park is 55 by 65 miles in breadth and length and contains a total of 3575 square miles area. The Hot Springs are terraced with huge deposits of lime that has been given up from solution by the overflowing water. Tourists can have horse shoes and wire ornaments containing their initials encrusted with calcium salts to take home as souvenirs. Seeing the park by the usual route takes six days. A single fee can be paid that will cover staging and hotel bills. There are hotels for night stops and camps for noon lunches. It is cold at night and usually hot and dusty during the day. Ice, snow, and boiling springs lie within a few feet of each other in many places, so that they can be touched almost simultaneously. At two places, en route, a man can catch fish and, without moving, dip them by a swing of his line into a nearby boiling spring and cook them. At the Divide the tourist can touch water that is flowing toward the Pacific Ocean and the Gulf of Mexico; to the right of him for one and to the left of him for the other. At the Obsidian Cliff, roads are crossed that are made of broken black glass which nature made. Near by are the dams that beavers have built. Part of the road is over a pass of more than 7000 feet in altitude, with snow clad peaks always in sight. The geysers are supposed to exceed in interest those of Iceland and of New Zealand. Old Faithful is always to be depended upon to spout. The Grotto Geyser if given time will display itself. Some of them, however, cannot be relied upon and may or may not show what they can do when being watched. The Paint Pots and Mud Geysers are interesting. Some of the

native bears have become so tame that tourists get near enough to photograph them. No one is allowed to injure the animals of the Park. There are myriads of wild flowers that are marvels of beauty. A steamboat sail on Yellowstone Lake adds variety to the method of travel. The Grand Canon of the Yellowstone, its superb falls, its brilliantly colored rocks and sands, its isolated pinnacles each of which has its eagle's nests, and its surrounding scenery, are magnificent. So captivated were we with the region that we lingered a week at the Canon Hotel. In Heyden Valley is a small herd of American buffalo that were a sad reminder of the thousands seen during the writer's boyhood trip across the overland trail in 1862.

ALASKA.

Returning to Livingston by coach and train we resumed our journey westward through Montana, Idaho and Washington. At Tacoma we found the tourist steamer "Queen" ready to receive us for a twelve days' trip to the beauty spots of Alaska. As in Norway, almost the entire route is protected from rough weather by island barriers. It is like sailing on rivers rather than on the sea. Islands of all sorts, sizes and kinds are passed making a perpetual panorama of changing beauty. Though much less imposing than the Norwegian fjords these have a charm of their own that is alluring. As the weather was a mixture of pouring rains and rifted clouds, through which the bright sunshine occasionally gleamed, we saw cataracts in profusion. A dozen could be seen, within an hour, pouring down from great heights into the sea. As our ship swept into some narrow bays the salmon were crowded before her in such numbers that they seemed to be walking over each other. On the shores, at some of the landings an attempt at botanizing showed the ground to be covered so deep with moss that the feet would sink out of sight into it. Trees, houses and

roofs of all kinds had their coats of moss that attested continuous rainy weather. The harbor of Sitka looked to be exceedingly beautiful. Juneau had a pretty position but was less attractive. Metlacatla interested us greatly because of its history, its salmon canning industry, its mission, and its people. The Muir Glacier was the sight of sights to all the passengers. Here were immense icebergs in the making before our eyes. Our ship had to keep at a respectful distance or they would quickly have sent her to the bottom of Glacier Bay. A trip to the summit of the glacier gave us lessons in regelation, earth carving, moraine depositing, the treachery of crevasses, etc., that were more impressive than our readings of Tyndall. We learned of the immense coal deposits on the many islands passed, of the gold mines that had yielded treasures of great value, and of the rich farming and pasture lands that await future pioneers and wondered if Russia did not regret her lack of forethought when she sold all these to us for such a trifling fraction of such wealth. At Victoria, Vancouver's Island, we received a British welcome that made us feel that Johnny Bull is not so bad a neighbor after all. Following an inspection of the interesting things around Seattle and Tacoma, and after getting a peep at superb Mount Rainier we proceeded by rail to Portland, Oregon. This is the one State that Horace Greely excepted from his advice of, "Go west, young man. Go west."

ACROSS NORTH AMERICA—EASTWARD.

The last touring letter left the Fortnightly readers at Portland, Oregon. Here we had expected to get a superb, inclusive view of Mounts Hood, Rainier, St. Helen's, Jefferson, and Adams, but the air was so hazy from forest fires that our hopes were blasted. To atone for this loss we took a trip up the Columbia River as far as Hood River, in order to see Mount Hood at closer range, to see the scenery of Columbia River and to observe the way that salmon are caught in that region. On our return we spent a very enjoyable day driving to Williamette and Portland Heights, to Vancouver and to the various public buildings, hospitals, and medical school. The railway journey from Portland to San Francisco is a long but interesting one. We broke it at Castle Crag and at Sacramento and would liked to have stopped at one of the way stations between Edgewood and where we first crossed the Sacramento River, but our arrangements would not permit of it. To our fancy there is no more wildly beautiful spot in America than this. Majestic Mount Shasta looms up in regal splendor with its diadem of snow. The train, in climbing the mountains, makes a number of loops upon itself where many miles of magnificent valley, crag, precipice, gorge, and mountain scenery sweep successively into view with awe inspiring grandeur. The Swiss-like appearance of the region around Castle Crag Tavern and Mossy Brae tempted us to linger beyond our allotted time, and thus to shorten our stop at Sacramento City. In the latter the writer had been before but it was new to

Mrs. E., and being the place where gold was first discovered in California she wished to see it.

SAN FRANCISCO.

At San Francisco, in common with most tourists, we put up at the Palace Hotel, making it our headquarters while exploring the various points of interest in the rest of the State. Never had that city seemed more captivating to me than on that occasion. Its "Nob Hill," its parks, its palatial homes, places of business, and public buildings appealed, even to the eye of a New Yorker, as worth a long trip to see. Its weird Chinatown, its Sutra Heights and gardens, and its Seal Rocks were sights that could not be duplicated in any other part of our country. We wearied ourselves drinking in the enjoyment that they brought and after successive trips to Oakland, to Berkeley, to Palo Alto, to San Jose and Mount Hamilton Observatory, to the Yosemite Valley and the Big Trees, and to other surrounding points of attraction we were aways ready on our return to take fresh turns at seeing the sights of San Francisco again. Golden Gate Park was particularly enticing. Its Strawberry Hill with Huntington's Cataract, its Japanese village, its Egyptian palace, its aviary, its Drake Cross, its Panorama building, its children's play houses, its flowers, called us back at each return to take other glimpses of them. When we finally turned our faces homeward we wondered how long it would be before we could see them again. Little did we think of what was soon to happen to all that beauty. It never occurred to us that when we should see it again, as we did on our arrival from Japan, on our peri-terrestrial tour, that its magnificent "Nob Hill," its fine public buildings, its Palace Hotel, and its streets of princely stores, would loom up as ruined, blackened skeletons mocking their former grandeur. When we next visited its peerless Golden Gate Park the neglect was so pronounced

that it saddened us. One other city we had, in the meantime, used, as we did San Francisco, as a center for our touring. This was Messina. From it we took our various trips through Sicily and when we left it for the last time there was no thought of its early destruction in our minds or that the friends we had made there would soon be numbered with the dead—crushed into eternity by falling homes. Bret Harte was right, for

> "The ship sailed safely over the sea.
> And the hunters came from the chase with glee,
> But the town that was builded upon a rock,
> Was swallowed up in the earthquake shock."

California is young and its early life was a strenuous one. It had small opportunity for cultivating science until quite recently but has made good use of that which it had. In San Francisco A. J. Lartigan has added to our knowledge of the bacteriology of gall-stones, and of adenoid tuberculosis; W. Ophuls of mold infections, amyloid degeneration, edema, and tuberculosis; J. M. Flint of the comparative anatomy of the intestines, lungs and joints; A. E. Taylor of enzymes, cytolysis, albumin synthesis, conditions favoring bacterial growth, and in other important directions. In Berkeley H. B. Torrey supplied new information on regeneration; J. B. McCallum on the histology of muscle, internal secretions, Wolffian bodies, and saline purgation; W. V Osterhaut on cytology; and Jacques Loeb on electrolytes in living matter, artificial parthenogenesis, and comparative physiology of brain. In Santa Rosa Luther Burbank has solved some puzzling problems of embryology through experiments in hybridization. In Oakland J. T. Gulick resides who, in the Hawaiian Islands, discovered a number of important facts in evolution. In Leland Stanford, Jr., University, at Palto Alto, President D. S. Jordan and V. L. Kellogg have taught us among other important facts the value of isolation in the origin of species, while F. M. McFarland and R. E. Swain have added to our knowl-

edge of cytology, histology, trypic digestion, uric acid, and other features of physiology. On Santa Catalina Island, not far from Los Angeles, there is a biological station for experimental work on regeneration, teratology, evolution, etc. Visitors there enjoy sailing in the glass-bottomed boats where they can look down into the seadepths and study marine plants and marine animals under normal conditions of life. The sight is at once beautiful, interesting and instructive. Before going to Santa Catalina, however, the tourist should take in the Yosemite Valley, on the way southward from San Francisco. This remarkable ice-cut gorge, like the fjords of Norway, is a reminder of the glacial epoch. Its Bridal Veil, Yosemite, Vernal, and Nevada Falls once seen are not likely to be easily forgotten. Its Mirror Lake, reflecting back the cathedral dome, and the views from Artist's and Glacier Points, with the tremendous precipice of the latter, make the onlooker feel the insignificance of man in contrast with the greatness of nature. The gigantic Sequoia trees, usually seen on the return trip from the valley, constitute one of the natural wonders of the world. The immensity of their size always elicits astonishment when seen in contrast with objects of known dimensions, but if only compared with each other it is impossible to have any adequate realization of their magnitude. To the visiting botanists their great age and the geological antiquity of the genus constitute their chief interest. Fossil remains, that have been found in different parts of our northren hemishere, tell us that these are but a small remnant of a once widely scattered tree and that it existed in great forests where now we have Greenland's icy mountains and Spitzbergen's frozen land. The cone of the Sequoia seldom exceeds an inch and a half in length but the sugar pine, that grows in the same region, has cones that are ten to fourteen inches long with corresponding width. The largest Sequoia that has been

found was 143 feet 5 inches in circumference at the base. There are over twenty of them in Calaveras grove that exceed 78 feet in circumference and 25 feet in diameter at the base. As most city houses are about twenty feet in frontage it is evident that a sawed-off section of any one of these twenty trees would make a larger dancing floor than the parlor of the average house, with the hall partition wall removed. One such tree contains about half a million cubic feet of building lumber. The red-woods, out of which most California lumber is cut, are a smaller species of Sequoia, and some very fine buildings of San Francisco and Los Angeles have been built entirely of lumber from these. The last named city now rivals San Francisco in beauty and being farther south its wealth of tropical vegetation and pretty gardens make of it a desirable stopping place for the tourist. Near it are many places of interest, such as Rodonda Beach, Santa Barbara, San Diego, Coronado Beach, Mount Lowe, San Bernardino, and the numerous orange groves.

ARIZONA, COLORADO AND NEW MEXICO.

After seeing these and visiting some of the princial points of sentimental attraction, in connection with the captivating story of Ramona, the writer bade good bye to California and sped eastward through Arizona and New Mexico. At Tucson, Arizona, is the Desert Experiment Station where D. T. MacDougal, C. S. Gager, B. E. Livingston, and others have succeeded in adding to our knowledge of heredity, the reactions of protoplasm to poisons, and some of the laws governing evolution. Livingston's experiments bid fair to enlighten us on how drugs act as curers of disease, although he had no such object in view when performing them. One drawback to Tucson, for the average tourist, is its remoteness from the great sights of that territory that every visitor desires to see. The Grand Canon of the Colorado is in the north while Tucson is almost at the

extreme south. If one or other has to be given up it is not likely that the canon will be that one. Its overwhelming grandeur and overawing vastness surpass anything of the kind that can be seen elsewhere on our planet. It is to canons what the Himilayas are to mountains—the unsurpassable. To study its surroundings and thus convince ourselves of the method of its carving, is to begin, for the first time in our lives, to realize, in a small way, the almost eternal age of our world. Seeing the figures, as so many millions of years, makes about as small an impression upon consciousness as water does on the back of a duck. Seeing from 4,000 to 7,000 feet of almost perpendicular walls that have been worn through by the river's flow as the land was slowly raised to ever-increasing heights all but staggers credulity. The stratified rocks down to the granite bed have been gnawed through by the water's rush of ages. The shifting of the river from time to time while accomplishing this tremendous task, has carved out strange forms that are likened to Hindoo temples, great spires, mountain domes, and the like, while the many shades of the rocks from browns, through yellows, to deep reds have left everything painted as if by a frenzied god. All of this lies far away below the observer's feet, and when he first comes upon it the astonishmen is indescribable. Imagining himself on the true surface of the land to thus, suddenly, find that he is on the very summit of a high mountain, is most startling. It takes some time to even partly reconcile one's self to the stupendous contradiction of feeling that it evokes. The highest peaks of the White Mountains, if dropped into that tremendous gorge, would, in places, fail to reach to the height of the feet of the on-looking tourist, providing their bases were trimmed so as to permit of being lowered therein. There is no evidence, anywhere, that any part of this gorge resulted from earthquake rupture or other such violence. The granite bed and

all the markings tell only of water erosion. The mesas, on the surface land, tell a story of still greater antiquity that helps confirm the record of the river's work. Among these mesas are many things of such enticing interest that the scientific traveller lingers long there after the average tourist has departed. The home of the Mochi indians, the ancient homes of the Cliff Dwellers, the petrified forest, and the prehistoric carved rocks, are among these. To describe what we saw of this character would over-reach the purpose of this letter, as would also descriptions of New Mexico, Colorado, and Utah scenery, through which we passed. The Royal Gorge, in the canon of the Arkansas River, should not be passed without being visited as it is one of the great sights of our country. The Garden of the Gods and Pike's Peak are sure to attract those who visit Denver. The scientific tourist should not miss going to Florissant which is not far from Colorado Springs. In the neighborhood of Florissant is a region that was buried ages ago in about the same manner as Pompeii. T. D. A. Cockerell, of Boulder, Colorado, has spent considerable time studying this region, and among the other important and interesting finds are some tsetse flies which were buried in the volcanic ashes and preserved so perfectly that we now know that the fly once existed in America. Along with it also existed here camels and other animals common to Africa. Some terrible catastrophe swept whole species of the animals of that time entirely out of existance on this continent. Prof. Cockerell hints at the possibility of the tsetse fly being the wholesale destroyer of that age. Although Prof. Cockerell is not a physician he has cast a side-light on medical matters by his study of evolution. As early as 1897 he called attention to the fact that disease must be a factor in natural selection. Among the physicians of Colorado who have contributed to the progress of medical science the one known

to the writer from his writings is Henry Sewall, of Denver, whose contributions to physiology and on Safeguards of the heart beat, as well as thoracic aneurism, have been important. Denver City is so well known to almost every one who has gone west that its description seems almost superfluous. Its most particular feature is its situation on the plain so near the Rocky Mountains. Every view towards the west is a mountain view and on looking eastward only a plain is in sight which, but for its low uneven hills, would, as in Illinois, carry the vision to the horizon. In clear weather the westward view shows Long's, Gray's and Pike's Peaks looming up skyward to altitudes of more than 14,000 feet. At a distance of 150 miles to the southwest can be seen the usually snow-clad summit of Pike's Peak. After having gone to the top of that mountain, on the cog road, from Manitou, it is interesting to look up at it from this remote point and to compare the labored breathing at the high altitude with the easy rhythm of heart and lungs in Denver. Upon the mountain the slightest effort makes the traveller gasp for breath and, on first experiencing it, fear that some sort of disease has taken possession of the lungs. An attempt at boiling an egg or some potatoes at that high altitude soon reveals what the real trouble is. Neither can be cooked enough so as to be fit to eat no matter how long the boiling is continued. The atmospheric pressure is so small that the water boils violently when barely hot.

MISSOURI.

Between Denver and the Missouri River all the exciting experiences of Indians, elk, and buffalo have disappeared. Even the prairie dog, the coyote, and the wild turkey are vanishing. Cities and villages have come to take their places, and where these plains were once swept with fierce fires of dried autumn grass, cattle safely graze within fenced pastures. No more do

Pawnees, Shawnees, and Shoshones contend with each other for the mastery of hunting grounds and the begging scarecrows, that occasionally appear at way stations to see the passing train, are but a sad reminder of the stately warriors whom, as a boy, the writer feared and respected. Once past the Missouri and there is nothing, save names, to recall the miles of untilled and unoccupied land that lay too far from a river to be considered worth pre-empting. The passenger steamboats that plied between Omaha and St. Louis, with Kansas City (Westport landing) between, are now but a memory. Railways have taken their places and made possible the building of an empire out of the neglected solitudes. Fortunes have been made and lost in land speculations. The unearned incerment made many rich while the increment that disappeared with shifting populations and abandoned sites made as many poor. A law that would tax away the former should, in order to be just, restore the latter. In Kansas City far more was lost than gained, but the hideous looking masses of loess were levelled at the cost of many a destroyed nucleus of a fortune, and a most unpromising looking region converted into a city of palatial homes. About midway between Kansas City and St. Louis is Columbia, Missouri, the site of the State University. Here some very promising work is being done for the advancement of medical science. C. W. Jackson has extended the boundaries of our knowledge in comparative anatomy and histology; Geo. Lefevre has given us new information on artificial parthenogenesis, regeneration, tissue grafting, and embryology; C. W.Green has taught us new facts about the osmotic pressure of the blood, and of the influence of inorganic salts on cardiac tissues; E. M. Dugger has cleared up some mysteries of plant resistance to disease; and P. Paquin gave to the English-speaking world its first journal of bacteriology.

ST. LOUIS.

A few hours railway ride from Columbia brings the traveller to St. Louis, the metropolis of the Mississippi Valley. Its three terraces, extending from the river front to the bluff at Cote Brilliante, together with the numerous hills beyond, give it a most attractive appearance. Its Forest Park, its Tower Grover Park, its Shaw Botanical Gardens, its beautiful cemeteries, and its numerous small parks make it a delightful place to rest and enjoy oneself, particularly in the spring, and its long Indian summer, which lasts from mid September to Christmas. The visiting medical man can find an embarrassment of attractions in the form of medical colleges, hospitals, and dispensaries. Of the first named there is the Washington University Medical Department, the medical department of St. Louis University, the College of Physicians and Surgeons, and the Barnes Medical College. St. Louis has long held a prominent place as a center of medical education. The first faculty of medicine was that of the St. Louis University, of the Society of Jesus, and was chosen in 1836. Four years after this the medical department of Kemper College, later known as the Missouri Medical College, and now as the medical department of Washington University, gave the first course of medical lectures, the other organized faculty having failed to start their classes. Because of the prominence of J.M. McDowell in managing of the medical department of Kemper College, during the first decade of its existence, it was locally known as "McDowell's College." He, and C. A. Pope, were the earliest prominent surgeons of the Mississippi Valley, while M. S. Linton and J. S. Moore occupied similar prominence as internists. The latter won national fame by his results in using calomel in treating cholera during the epidemic of 1849. The St. Louis Medical Society was organized some time between 1830 and 1837, and it was chartered

in 1837—it antedated the state society by about fifteen years. Among the charter members B. G. Farrar, H. Lane, J. Johnson, H. King, C. J. Carpenter, H. McCabe, B. B. Brown, and Y. D. Boling are mentioned in the act of incorporation, while among its early members was Wm. Beaumont who won world-wide fame through his experimental work on digestion. In 1822 a young man named Alexis St. Martin was wounded by the accidental discharge of a gun at the distance of about three feet from his body. Among other injuries was a perforated stomach. He came under the care of Dr. Beaumont and when he had recovered it occurred to the doctor that this would be a good case in which to study human digestion, inasmuch as, in defiance of all treatment, there was established a permanent gastric fistula of about two and a half inches in circumference. In 1825 Beaumont took St. Martin into his employ as a servant using him for the study of digestion for eight years. The results thus obtained constitute the first scientific knowledge the world had on the subject. So well was the work done that little had been added to our knowledge until a Russian named Pavlov—whose name American authors persist in Teutonizing into Pawlow—within recent years greatly extended it. The next important piece of scientific advancement for which the world is indebted to St. Louis was the devising of the Hodgen splint by J. T. Hodgen. It revolutionized the method of caring for hip and thigh fractures. In medicine, botany and meteorology G. Englemann brought honor to the profession. As the one thorough pioneer botanist of the West, and as the earliest of American students of meteorology he greatly aided phylogenetic botany and was the forerunner of "Old Prob." To C. Michel we are indebted for medical electrolysis which he employed successfully in connection with the eye, while Hardaway developed its use in dermatology. To E. J. Swift must be credited some recent

knowledge of eye defects in children, neuroses of childhood, and the bearings of psychology on heredity. To E. P. Lyons we owe recent knowledge concerning physiological compensatory motions, tropisms in cell functioning, the cyanides and oxygen respiration, and the effects of lack of oxygen. H. von Schrenk has advanced our knowledge of phyto-pathology. As an early

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foretaste of new methods in instruction which the St. Louis leading medical schools have inaugurated are the first-fruits from Guthrie and McGuigan. If C. C. Guthrie's work on ovary transplantation proves flawless, under repetition by others, it is epoch making. It definitely settles a long-standing, fundamental, and exceedingly important dispute on heredity. H. McGuigan has supplied us with experimental evidence of the direct utilization of the common sugars by the tissues and has given us new facts concerning glycolysis that will greatly aid us in solving the problem of the etiology of diabetes.

ILLINOIS.

In going eastward from St. Louis, by the Wabash, the passenger passes within easy distance of the State University of Illinois, at Urbana. Here H. B. Ward has recently become a teacher. To him we are indebted for a large amount of information concerning parasites and parasitism, particularly in regard to metazoan parasites. He has done much in the way of helping us to a knowledge of the relationship between animal and human parasitic diseases. Here G. T. Kemp isolated some poisons of pathogenic bacilli, studied the influence of curare on muscle metabolism, taught us the relation of blood-plates to hematogenesis and to coagulation, and the effects of altitude on the blood. Here H. S. Grindley extended our knowledge of the proteins of meat and S. A. Forbes taught us new facts about the diseases of insects.

KENTUCKY.

Exclusive of scientific interest there is nothing likely to hold the tourist here long while a detour to the southeast, via Louisville, will carry him toward the Mammoth cave of Kentucky—the largest known cave in the world. On the way Wyandotte cave might be included but the writer never having visited the latter is unable to describe it. In passing through Louisville the medical visitor should recall the fact that S. D. Gross, the well-known surgeon, taught here for a short time and that it was here that he performed his experiments on wounds of the intestines. About as far to the southeast of Louisville as the Mammoth Cave is to the southwest, lies Danville the old home of Ephraim McDowell, "Father of Ovariotomy," where he performed the first successful ovariotomy on a Mrs. Crawford of that place. In McDowell Park, Danville, the Kentucky State Medical Society erected a monument to his memory on which appear the words: "Honor to whom honor is due." Connected with the

Mammoth Cave, at a period not remote from the time of McDowell's success, a melacholy effort was made at trying to cure pulmonary tuberculosis by residence therein. Away from sunlight, through a passage guarded by myriads of bats, credulity buried the living victims of a disease that needed, above all else, light and free air. Buoyant hope made some of them think this immurement was benefiting them, but after the sacrifice was sufficiently great to convince the most stupid, the "sanitarium"—save the mark—was abandoned. This cave is a huge affair and has been explored to a distance of ten miles from the mouth while its zigzag paths and passages measure nearly 150 miles. It requires two days of travel to see only the chief points of interest, but the intervening night is spent at the hotel outside the cave. To the biologist the blind fish and eyeless crustaceans are among the most interesting things there. The atrophied spots that mark the places where seeing eyes once existed in their progenitors, and that now exist in their nearest of kin, tell a wonderful tale of reversed selection through lack of use. They also suggest how great must be the antiquity of that once subterranean river. The water has not all gone from there as the visitor discovers when he has to be ferried over Echo River in a boat and when he passes the River Styx, Lake Lethe, and the Dead Sea. Some of the chambers are of vast proportions, the famous Star Chamber being nearly 500 feet long, 70 feet broad and with a ceiling 70 feet high. The highest domes exceed this greatly in height, Lucy's Dome being nearly 300 feet to its top. Stalactites and stalagmites of grotesque forms, numerous sizes and curious combinations are abundant, but are found only in special parts of the cave. While they are very interesting and very beautiful they lack the cleanness and fairy-like combinations of colors found in those of Luray Cave, Virginia.

CINCINNATI.

The trip from Mammoth Cave to the Shenandoah Valley, with its Natural Bridge and Luray Cave, if taken by way of Cincinnati, will give the medical tourist a chance to see another of the places where S. D. Gross taught anatomy. It was in this city that he gave the first systematic course on morbid anatomy ever delivered in the United States. Here too Daniel Drake wrote what Dr. W. H. Welch calls the "Monumental Work on the Diseases of the Interior Valley of North America." Willard Parker taught surgery in this city before going to New York. In our own day J. U. Lloyd here advanced our knowledge of the alkaloids, glucocides, and other active principles of medicinal plants, and H. Ayers our knowledge of vertebrate morphology. Cincinnati contains many hospitals and dispensaries. Its City Hospital has been referred to as one of the largest in the world. It has three medical colleges and many handsome public buildings.

CIVIL WAR SCENES.

The trip from there eastward takes the traveller through some interesting mountain scenery. At Shenandoah Valley Junction, if the journey is made on the "B. & O.," the tourist finds himself in one of the great historical regions of the civil war. Gettysburg is north of him, Bull's Run southeast, and Harper's Ferry, the scene of John Brown's celebrated raid that cost himself and sons their lives, is in easy walking distance. About 50 miles southwest, on the Shenandoah Valley Railway, lies Luray and about 75 miles farther, on the same road, is the celebrated Natural Bridge of Virginia. Luray cavern should not be missed by any traveller in that region as it is—incomparably—the most beautiful of stalactite deposits yet discovered. Natural Bridge figures so conspicuously in our school books that everybody knows about it. The gorge it crosses is 215 feet deep and 60 feet wide with a road on the top.

Botanists will be interested in the walking ferns found below the bridge.

WASHINGTON

The run to Washington only consumes a few hours There the chief among the sights are the Capitol and the Congressional Library. The latter is the most beautiful building in our country and is a composite of several Parisian places of note. The Washington Monument, Treasury Building, State, War and Navy building, Corcoran Art Gallery, Bureau of Engraving and Printing, Smithsonian Institution, National Museum, Agricultural Building, Fish Commission Building, Botanical Gardens, and a trip to Mount Vernon, to see the home of Washington, make an itinerary that gives a good idea of the place. The hospitals, asylums, and public homes will, of course, be seen by the visiting physician. Washington has drawn men of culture from all parts of the United States and its residents have therefore done much, in the regular line of their official duties, or through independent initiative, for the promotion of medical knowledge. From here G. M. Sternberg directed the researches of W. Reed, J. Carroll, A. Agramonte, and J. W. Lazear when they, experimentally, revealed the part played by mosquitoes in yellow fever. Here was W. C. Gorgas, headquarters when, in Cuba and the Canal Zone, he subdued yellow fever. Here Walter Wyman, by skilful management of the Public Health and Marine Hospital Service, has abetted research and given several practical lessons in sanitation. Here D. E. Salmon and Theobald Smith, as already mentioned, made the world their debtors by the discovery of the relationship of toxins to immunity. Here C. W. Styles advanced our knowledeg of protozoon diseases and of hook-worm disease. Here L. O. Howard extended our knowledge of the "typhoid fly" and of the malarial and yellow fever mosquitoes. Here Reid Hunt worked out a standard for thyroid extract and increased

our information regarding the physiology of the cardiac nerves and of the suprarenals. Here J. H. Kastle taught us many new and important things about lipase, invertase, and oxidases. Nearly twenty years

G. M. STERNBERG, M. D.
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ago A. F. A. King here solved the problem of the relationship of malaria and mosquitoes, but we refused to give heed to his evidence until England had won the glory from us by research of another kind. Indirectly medical science has been aided by the rediscovery of Mendel's law by W. J. Spillman of this city and he, F. O. Cook, W. A. Orton, A. F. Woods and H. J. Webber have extended our knowledge of phyto-pathology and evolution.

W. H. WELCH, M. D.

President, American Medical Association, 1910-11.

In crediting the yellow fever triumph to denizens of Washington it should not be forgotten that Sternberg, Reed, Lazear and Carroll were students of W. H. Welch, of Johns Hopkins University, Baltimore. Nor should the fact be overlooked that Dr. Welch has been to American medical progress what Johannes Muller was to German biological develoment. The astonishingly large number of his pupils who have won distinction, and fill places of responsibility and honor, is the best evidence that could be asked for of the great work he has done and is doing for American medicine. Aside from this, however, he has, personally, supplied us with new knowledge in bacteriology, pathology, and physiology. Among the most important of these is his work on thrombosis, embolism, surgical infections, fevers, glomerulo-nephritis, diphtheria, loss of bacteriacidal power of the blood, why bodies decompose rapidly after snake poisoning, and the discovery of the pathogenic organism Bacillus aerogenes capsulatus. To him we are indebted for the first American Journal of Experimental Medicine. His colleague, W. H. Howell, has among other important discoveries given new knowledge of the proteids of the blood, the mechanism of sleep, the cause of the heart beat, the origin of red cells, the relation of inorganic salts to the heart beat, and nerve regeneration. Before moving to New York W. G. McCallum gave the first clue to the nature of the supposed "flagella" in halteridium, thus making Ross's discovery of the malarial parasite in the mosquito possible, showed us the relationship between calcium metabolism and tetany, and in various ways advanced our knowledge of protozoology and bacteriology. H. A. Kelly introduced the operations for nephro-ureterectomy and uretero-ureterostomy taught a new method of catheterizing the uterus and in a number of ways advanced gynecology. H. P. C. Wilson was

the first gynecologist in Baltimore, was the first in Maryland to perform Sim's operation for division of the cervix uteri, and to remove the uterine appendages by abdominal section. "He was the second physician in the world to remove, by cutting into

H. A. HARE, M. D.
PHILADELPHIA

pieces, a large intra-uterine fibroid tumor filling the whole pelvis." The patient recovered. It was in Baltimore that John Crawford, in 1807, first declared that malaria was carried by mosquitoes. Other Baltimoreans who have helped us along the road of medical progress through research are W. S. Thayer on the heart and blood in acute diseases., F. P. Mall on the structure and embryological development of vari-

ous organs and on human monsters, H. Cushing on the function of the pituitary and in bacteriology, E. A. Andrews on leucocytes, E. L. Mellus on the anatomy of the central nervous system, W. H. Lewis on the embryology of eye, arm, head, etc., P. W. Dawson the regeneration of nerves and L. F. Baker on the chemistry of proteids.

PHILADELPHIA.

Every visitor to the eastern seaboard is as anxious to see Philadelphia as he is to see Washington or New York. All have heard of Independence Hall and its collection of memorials of the dawn of American Independence, of the old Penn Hospital of 1755, of the Betsy Ross house where the first American flag was designed and made, of the old Livesey house where Washington had his headquarters, of William Penn's house, of Benjamin Franklin's tomb, of liberty bell, of Fairmount Park, of the Wissahickon, and of the numerous beautiful public buildings, colleges, churches, and hospitals. All desire to see where the declaration of Independence was signed and to visit the various places made attractive by their connection with the early history of our country. Visiting physicians will remember that one of the signers of the declaration of independence was Benjamin Rush, professor of chemistry of the Philadelphia Medical College, and afterwards professor of practice in the same institution. He was the first to insist on the fact that yellow fever is non-contagious and he added more new facts to medicine than all who preceded him in this country. Philip Syng Physic, another of the professors, was "the father of American surgery." S. G. Morton, of the next generation, was, probably, the most thorough anatomist of his time. W. E. Horner, successor of Dr. Physic, added to our knowledge of anatomy and histology. J. Leidy, a student of Horner's, added very materially to our knowledge of comparative anatomy and was the first to distinctly declare that flies carry

germs. S. Weir Mitchell discovered new facts in nervous pathology and the nature of venoms. H. C. Wood has given us new facts in pharmacology, therapeutics, nervous diseases, and sunstroke. C. E. de'M. Sajous has been a prolific writer and has advanced our knowledge in internal secretins, hay fever, and diseases of the nose

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and throat. H. A. Hare has taught us many things about drug therapy and of the effects of drugs on bacteriolysis. Leo Leob has hepled us to our knowledge of myocarditis, growth of epithelium, edema, and relation of ovaries to decidua. J. H. Musser has advanced our knowledge of post-operative tetany, enlarged prostate, carcinoma of the stomach, the Cammidge reaction, etc. E. H. Goodman was associated with Dr. Musser in his work and has given us new information concerning the physiology and pathology of the saliva, the Solomon test in carcinoma of the stomach, the Cammidge

reaction in lesions of the pancreas, and on diabetic acidosis. Horace Jayne has extended our knowledge in comparative anatomy. G. A. Piersol has developed new facts concerning the embryolgy of the sense organs, the origin of lymphoid tissues, and the etiology of monstrosities. A. C. Abbott has carried us into new facts in the fields of infection and immunity. A. Stengel has taught us new things about diseases of the blood and of the heart. M. P. Ravenel has shed new light in some dark places in comparative patholgy, tuberculosis and immunity. T. H. Montgomery, though not a physician, has increased our knowledge of cell mitosis and given us new ideas in phylogeny. It is thus evident that Philadelphia is alive to the interests of humanity and the most approved ways of advancing the same. As early as 1847 she showed us this spirit of progressiveness by organizing the American Medical Association with Nathaniel Chapman as its first president.

NEW ENGLAND.

Before ending our tour of where North American medical science is now growing we must not forget New England. In going thither a stop at Princeton, Menlo Park and Rahway, New Jersey, will bring us to where E. G. Conklin discovered some most important principles regarding the differentiation of the egg in its development, where T. A. Edison aided medicine in developing skiography and the electric light for diagnostic purposes, and where E. M. Moore was born. Moore was one of the founders of the American Surgical Association, advanced our knowledge of the treatment of fractures, of the physiology of the heart's action, and of blood transfusion. His principle research work was done in New York State. As a well known Philadelphia physician, G. M. Gould, has recently moved to Ithaca, in that state, and as some research work has been done there that should be recorded, a short detour in that direction will be of interest, particu-

larly as it will give the visitor a chance to see nearby Watkins' Glenn, one of the chief beauty spots of New York State. Gould has greatly aided American medical progress by his year-books and other literature as well as by his studies of diseases of the eye. It is in Ithaca where B. G. Wilder has prosecuted his extensive studies in anatomy, and particularly the anatomy of the brain, and in morphology. Here P. A. Fish has advanced our knowledge of comparative physiology, S. H. Gage of histology and embryology, and G. F. Atkinson of phyto-pathology.

Leaving Ithaca we will go direct to New Haven, Connecticut. A number of railway routes may be chosen all of which the writer has travelled upon but, for present purposes, an automobile ride would be appropriate if not so expensive. The doctor's auto has become possible because of the labors of a man born in New Haven. Without rubber tires it could scarcely have been made a success and the hardening of rubber for tires, drainage tubes, irrigating fountains, syringes, pessaries, supports, and numerous instruments used by medical men we owe to Charles Goodyear. Mocked and made fun of as a silly dreamer, imprisoned for debts incurred in his work for humanity, robbed right and left after his success, such was the reward of this Connecticut inventor. It was in New Haven that Nathan Smith founded Yale medical school and invented a number of surgical instruments, Nathan Ives first administered chloroform for asthma, croup and atonic quincy, Jonathan Knight first treated aneurisms by compression, and W. O. Atwater showed us how to study nutrition scientifically. At present R. H. Chittenden is extending Atwater's researches and giving us much information concerning enzymes and metabolism. T. B. Obsorne is revealing the nature of proteins—an epoch-making piece of work, and has helped us toward the solution of the thyroid function, O. T. Osborne has cleared up problems of

acromegaly, organic extracts and blood diseases, L. B. Mendel those of excretion and nuclein metabolism, and W. R. Coe of embryology. In near-by Middletown, H. H. Conn has helped solve problems of evolution and bacteriology.

BOSTON.

In going to Boston, Plymouth Rock, where the Mayflower landed should be visited. At Plymouth Samuel Fuller was the first physician of the pilgrim fathers. What would he have thought had he visited Boston at a later date and seen J. C. Warren give the first anesthetic in surgery or perform the first operation for strangulated hernia? Imagine his feelings at hearing Oliver Wendell Holmes, as a sympathizer with Semelweiss, denouncing the dirty hands of obstetricians as the cause of puerperal septicemia, or Asa Gray in a heretical defense of Darwin. Could he have been present at the founding of Harvard by John Warren and seen its first home and then came later to see those jewels of Greek beauty—the modern Harvard medical buildings, he would have been compelled to think that civilization does move upward. The clear cut medical philosphy of Jacob Bigelow, a look at the experimental work going on at the Harvard laboratories and at Woods Hole, and an explanatory lecture from H. P. Bowditch, "the leader of American Physiologists," would have astonished him. But, alas, some modern doctors wonder what recent research on plants, hydra, dogs, cats, or apes has to do with giving pills. Boston contains many able men who are devoting their lives to such work. Theobald Smith has already been referred to. H. P. Bowditch has made many new discoveries in the physiology of the heart, nerves, vision, etc. M. J. Rosenau has done like wise in anaphylaxis, vaccines, standardizing antitoxins, plague, tetanus, etc. W. T. Councilman has done the same for pathological anatomy, and the etiology of small-pox. F. B. Mallory has discovered

new methods of staining tissues to aid in research concerning them, and has in creased our knowledge of typhoid fever, meningitis, and diphtheria. Among others whose work has aided medical progress are H. A. Christian in pulmonary embolisms, dermoid cysts, and leucocytoxins, R. C. Cabot in serum diagnosis and alcoholic arterio-sclerosis, T. Dwight in anatomical variation particularly of human bones, A. Cleghorn in the mechanism of respiration and the effects of fatigue products on the heart, T. Hough in fatigue and in cutaneous capillary pressure, W. B. Cannon on the mechanism of digestion and other physiological subjects, W. E. Castle in hybridism, heredity and animal dimorphism, and E. L. Mark on cytology as related to heredity. The number of these experimenters is growing rapidly and while but few of them give us epoch-making results all such work, if carefully and conscientiously done, forms a lever of great power in building up truth. The fad of considering experimental work as the all-in-all is, at present, the most dangerous disease that progressive humanity has to deal with. It is a brain virus that is distorting the mental vision of many great minds. Without the prevision that comes from great laws and great principles, good as all this work is, we can safely pronounce it utter trash till brought into a comprehensive generalization. These many workers form but a fraction of the newer ones that our universities are turning out and careful as has been the effort of the writer at trying to get together all prominent ones it would be miraculous if we had succeeded perfectly. No one person can be sufficiently familiar with the various departments of research to be able to find them all. Enough have been given to add zest to our tour of America for medical readers. But such readers want more than such details of work. They want to know something of the great sights of the places visited and a visit to Boston that failed to tell of Bunker Hill Monument, the

harbor and its celebrated "tea party," Fanuiel Hall, etc., would be like the play of Hamlet with Hamlet left out. Every doctor going there expects to see the old State House and its collection of antiquities, old South Church where the exciting meetings of revolutionary times were held and where now the revolutionary relics are kept, Christ Church from the belfry of which the lanterns were hung out for Paul Revere, Beacon Hill with its Boston State House, that figures as "The hub of the universe," and that overlooks the celebrated "Common" and the handsome public gardens, its 20 odd hospitals, 30 asylums and public homes, its museums, handsome public buildings, numerous parks, and quaint, crooked streets. There is a historic charm about Boston that no other city of our country has so that a medical tour of the world could end in no more appropriate place. We will then, for the present, bid the readers of the Medical Fortnightly a fond adieu and leave them visiting and studying the significance to themselves and others of America's "Cradle of Liberty."

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